Human Capital and Cash Holdings of Foreign Companies

An Evidence from Developing Economies

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Abstract

This study investigates the relationship between human capital investment opportunities in developing economies and cash holdings of foreign firms. Using a sample of 1838 foreign firms operating in Brazil, Russia, India, China and South Africa, I find a positive relationship between cash holdings of foreign firms and human capital investment opportunities, measured by human capital opportunities index (HCIOI). Moreover, foreign firms in China and India face more human capital opportunities and the impact of human capital investment opportunities is stronger for i) foreign firms than domestic firms; ii) labor-intensive industries than capital-intensive industries; iii) non-distressed firms than distressed firms; and iv) financially constrained firms than unconstrained firms.

Keywords: *Human capital investment, cash holdings, developing economies, BRICS.*

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LIST OF ABBREVAITIONS

2SLS: Two Stage Least Squares

BRICS: Brazil, Russia, India, China and South Africa

EC: Employee cost

EE: Employee Efficiency

EI: Education Index

ESO: Employee Stock Options

EWI: Employee Welfare Index

FDI: Foreign Direct Investment

G7: United States, United Kingdom, Canada, Japan, Germany, France and Italy.

HCI: Human Capital Investment

HCIOI: Human Capital Investment Opportunities Index

IMF: International Monetary Fund

HDI: Human Development Index

MNEs: Multinational Enterprises

OLS: Ordinary Least Squares

R&D: Research and Development

1 INTRODUCTION

The increasing growth rates in developing economies in particular in BRICS countries provide the platform to multinational firms to invest in these countries, because increasing demand and spending in these economies compensate the slow growth in developed economies (Wilson and Purushothaman, 2003). Besides this, developing economies have higher earning potential due to lower cost structure, thus they motivate investors to invest and yield higher returns but at the same time problems such as brain drain and low education level[1] in developing countries lead to more competitive labor markets; many foreign firms face the challenges of hiring quality employees and then keep them motivated to retain them. Past studies found that human capital investment practices such as high wages have a positive impact on overall performance of firm (Faleye and Trahan, 2011; Ertugrul, 2013; Ghaly *et al.*, 2015). Therefore, it is important to examine the impact of human investment opportunities on foreign firms' financial policies. Even though in past a few studies have examined the impact of foreign firms' decision making in developing economies but there are no studies on impact of human capital investment on cash policies of foreign firms.

In this study, I empirically analyze the relationship between human capital investment opportunities and corporate cash holdings. I use cash as dependent variable because cash is the most liquid asset and it takes substantial portion of total assets of firm. Past studies suggest that corporate cash holdings vary across firms and range between 7 percent and 23 percent depending on industry where firm is operating (see e.g., (Tim Opler *et al.*, 1999; Ozkan and Ozkan, 2004;

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[1]Education index of developing countries is low compared to developed countries.

Kin-Wai Lee and Lee, 2009; Huang *et al.*, 2015). Second, managers show their discretion on excess cash and they may use excess cash for value destroying activities (Jensen, 1986).

The stakeholder theory identifies that stakeholders such as employees, suppliers and customers influence the firms' financial policy (Titman, 1984; Cornell and Shapiro, 1987). Human resource is key factor of production and it also provides competitive edge to firms. Prior literature finds a positive relationship between human capital and firms' performance. Companies with better policies for employee welfare, get competitive advantage in operational activities which helps in increasing the shareholders' wealth (Jiao, 2010; Edmans, 2011; Faleye and Trahan, 2011; Ertugrul, 2013; Ghaly *et al.*, 2015).

Based on above literature and stakeholder theory, I predict a positive influence of HCI opportunities on corporate cash holdings. According to stakeholder theory, firms get employee commitment by maintaining substantial financial resources, as employees believe that they will get benefits from these resources as firm will invest these for their welfare (Cornell and Shapiro, 1987). Therefore these financial recourses lead to implied promises to employee commitment, which are not legal agreements but still very vital to firm performance. There are two main reasons for keeping those promises. First, as there is a positive relationship between corporate financial policies and firm's commitment to fulfill its promises to all the stakeholders other than shareholders such as employees, suppliers, customers, societies and government (Cornell and Shapiro, 1987; Morck and Yeung, 1991). In case of firm's failure to its commitment for employee welfare and being unable to fulfill its promises of providing those benefits and opportunities for self development and career growth of employees will make them dissatisfied. This will result in employee turnover and a negative image of company in market. As firm's management is custodian of all the stakeholders, so employee turnover will convey a negative

message that management is not good in dealing the stakeholders and this will result in decreasing implicit claims on new investment which will lower the potential cash flows to firm and consequently firm value will fall (Cornell and Shapiro, 1987).

Second, due to high competition in labor market and firm's changing nature, maintaining high quality employees have become vital to success of firms (Zingales, 2000). Firms working in new competitive environment are more human capital intensive. This leads to need for investing in human capital by providing them incentives to become more efficient (Zingales, 2000; Lawler, 2008).

In past few decades, there is significant increase in cash holdings of firms. Falato *et al.* (2012) argue that the structural change of firms towards the intangible capital might be one of the reasons to change the cash policy, by maintaining higher level of cash. Holder *et al.* (1998) found a positive relationship between cash holdings and dividend policy. They argue that firms follow conservative cash policy by maintaining higher level of cash to convey a signal to shareholders that we have enough cash to pay dividend, which induces the shareholders' commitment towards firm. Similarly, by maintaining higher level of cash firm is conveying a signal to employees that increases their expectations and performance. Brown and Matsa (2015) found that there is high turnover and fewer applications for jobs in distressed firms. This suggests a positive relationship between firm's financial position (i.e. cash) and employee expectations, as existing and potential employees predict the future of firm by looking at their financial position. Therefore firms with bad financial positions find it difficult to recruit high quality employees. The authors emphasize that these employee related incentives urge firms to maintain a conservative cash policy.

The above mentioned arguments propose that the firms should maintain more cash to signal their stakeholders about their ability to provide and maintain employee benefits. These arguments are more valid for MNEs working in developing countries, because there is more need to improve employee welfare since developing countries lack in high quality education, therefore investing in human capital will increase their working capacity which will bring efficiency and help MNEs in earning better returns.

To empirically investigate the relationship between firm's human capital investments and its cash, I follow the recent study of Ghaly *et al.* (2015) where authors use employee welfare index to proxy employee friendly practices. I use firm and country specific variables to construct an index to proxy human capital investment opportunities in developing economies. According to my prediction, the higher the human capital investment opportunities, as determined by a higher HCIOI score, the higher will be cash holdings.

Using a sample of 1838 foreign public firms operating in BRICS economies for a period of six years from 2010-2015, I find that foreign firms hold higher level of cash when they face higher human capital investment opportunities. The findings are economically significant and show that an increase of one point in HCIOI leads to 1.23% increase in cash holdings of foreign firms. The impact of HCI opportunities on cash holdings is stronger for China and India than Brazil, Russia and South Africa. These findings are robust as various model specifications show consistency in results. Moreover, results are consistent with stakeholder theory as the relationship is stronger for industries which are more labor intensive such as agriculture, healthcare, hotel and restaurants, mining, and telecommunication. In order to better understand the cash holdings-HCIOI relationship between foreign and domestic firms, I use additional sample of 2103 domestic firms. FollowingRita Almeida (2007), I argue that the influence of HCIOI on cash holdings is stronger

for MNEs than domestic firms. Results show that results are consistent with predictions of Rita Almeida (2007) that relationship between HCIOI and cash holdings for MNEs is stronger than domestic firms, as foreign firms offer higher wages and incentives to their employees than domestic firms.

Next, I analyze the role of financial distress and constraints to better understand the impact of HCIOI on corporate cash holdings. Following Acharya *et al.* (2012), I argue that non stressed firms to hold more cash than stressed firms in relationship with HCIOI as firms facing distress risk will have higher cost of holding excess cash. Rather investing on human capital opportunities, distressed firms will use additional cash to service debt, this leads to weak relationship between HCIOI and cash holdings. Using Altman z-score as proxy for financial distress, findings show that cash holdings-HCIOI relationship is insignificant for distressed firms. Next, I analyze the role of financial constraints among non-distressed firms. Following Laurence Booth *et al.* (2015), I argue that cash holdings-HCIOI relationship is stronger for financially constrained firms than financially unconstrained firms. Using the (Whited and Wu, 2006) index to classify firms into constrained and unconstrained, findings show that the relationship between cash holdings and HCIOI is stronger for constrained firms. This relationship is consistent with precautionary saving motive of cash because due to adverse selection and agency cost of debt, external financing is not only expensive but also difficult to find.

Endogeneity is one of the problems that may affect the robustness of the findings of the study as estimators will be inconsistent. There may be spurious correlation due to some unobservable variables which are related to HCIOI and also determine the cash holdings. For example, companies with very good financial performance can offer higher wages regardless of employee

quality and there may also be the case that a firm belongs to industry where average wage rate is higher. It is also possible that firm's cash policy is independent of human capital investment; in contrast, excess cash provide the luxury to firms to invest in employee welfare (Hong *et al.*, 2012). To overcome the problem of endogeneity, I use instrumental variable approach following two-stage least squares (2SLS) regression. Based on past studies, I find firm and industry specific instrumental variables. Following Majumdar (1998), I use employee cost turnover ratio as firm specific instrument whereas industry average cost of employee is used as industry specific instrument. I also use market to book ratio as proxy for growth opportunities and find a positive relationship with cash holdings.

Next, I use firm specific variables in HCIOI and country specific variable "education index" as explanatory variables and find consistency in relationship between cash holdings and HCIOI. I also use profit per employee and cash flow per employee as alternative measures of employee efficiency to capture HCI opportunities. The reason for using these variables is to account for employee contribution in adding value to shareholders. Since, sales do not give any idea about overall outcome of operations, so using these measures can also focus on end results. Findings show that even using cash flows and profitability as efficiency measures, the impact of HCI opportunities on cash is still positive and significant. Finally, I use cost of employees to efficiency ratio as alternate measure of HCIOI and find positive relationship. Based on these additional tests, the findings on relationship between cash holdings and HCIOI are robust.

My study contributes to existing literature in various ways. First, I give a novel analysis of impact of human investment on cash holdings of foreign firms. Secondly, this study provides an evidence on cash policy of foreign firms in developing economies compared to developed countries in terms of human investment.

To the best of my knowledge, in existing literature only three research studies (Klasa *et al.*, 2009; Schmalz, 2013; Ghaly *et al.*, 2015)are available on the relationship between cash holdings and workforce. Klasa *et al.* (2009) found a negative relationship between cash holdings and management union relations. Firms with stronger labor unions normally hold less cash to get better bargaining power in negotiation process. Schmalz (2013) investigated the impact of unionization on cash holdings and found that there is incentive to firm for managing the human capital risk. Results show that cash holdings provide financial flexibility in dealing with unionization rigidity. Ghaly *et al.* (2015) examined the relationship between cash holdings and employee welfare. They found a positive relationship between cash holdings and employee well being. My analysis is different from all these studies, as it not only focuses the impact of human capital on cash holdings but also focuses on opportunities available to foreign firms to exploit domestic firms in terms of making investments in human capital (Rita Almeida, 2007). Since previous literature focuses on developed economies as all three studies include sample from USA therefore this study attempts to fill the gap of relationship between human investment and financial policies in particular cash of foreign firms operating in developing countries.

Past studies in developing economies only consider one component of human capital at a time but I combine firm specific variables and economic variables to better reflect the human capital opportunities. Secondly, I combine employee cost and productivity together which was missing in past literature of human capital as many studies have taken KLD index as proxy for human welfare which only takes the components that reflect employee welfare but does not incorporate the outcome of employee welfare. As past studies have found that even a dissatisfied employee may still be productive due to emotional attachment or where employees do not have other job option. Since developing economies already face the problem of unemployment and getting a job

is hard to find so employee motivation and productivity may be driven by fear of losing the job on basis of poor performance. Considering these challenges in developing economies combining cost and benefit together can give better measure for analysis.

This study should also help financial policy makers in making foreign investments, as this study measures the HCI opportunities in each of five developing countries. As the results show that the impact of HCI opportunities on cash holdings is higher for MNEs operating in China and India and considering that FDI has been increasing in these two economies, so new foreign firms aiming to enter these economies may consider the challenges of human capital and design policies accordingly. At the same time it can also benefit the domestic firms in designing the cash holding policies, given that foreign firms hold more cash and exploit domestic firms.

Finally, my study adds value to existing literature on determinants of cash holdings as in past studies there have been focus on determinates in general but there is no distinction between foreign and domestic firms. One example is research and development expenditure, as findings of this study show that R&D is positive and significant for domestic firms but insignificant for foreign firms. This finding is consistent with past studies as multinational firms make huge investments in R&D but subsidiaries of foreign firms invest less in R&D compared to domestic firms. Foreign firms are rich in technology, financial and human capital, transfer of knowledge and technology from other operating countries, acts as a substitute for the investment in external R&D (Un and Cuervo-Cazurra, 2008).

2 LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

This section contains theoretical background of study and hypotheses. Subsection 2.1 contains the related literature whereas subsection 2.2 consists of related studies to develop hypotheses.

2.1 Literature Review

This section consists of theoretical background that highlights the human capital concepts and then relates human capital with skills required to perform job and their impact on firm performance. Finally, I derive theoretical model based on the literature that provides the foundation for hypotheses development.

2.1.1 Human Capital

Considering human beings as capital and including them in analytical framework is not new idea. Many economists in past have considered human as capital arguing that human beings are core contributor in firm's operations through their skills, knowledge and capabilities. Adam Smith and JB Say considered human abilities and skills as human capital, on the other hand Marshal and Fisher considered humans as capital. Human skills are like machine that has the cost and generates profits (Smith, 1776). Worker productivity can be increased by investing money in developing their skills, so human skills are regarded as capital (Say, 1821).

The work of Schultz (1961) and Becker (1962) is considered as the revolution in field of human capital as they formalized the "Human Capital Theory". Schultz (1961) identified the expenditure incurred on employee education as an investment, whereas Becker (1962) analyzed the relationship between the rate of return and the investment incurred on employee education and training. Becker (1962) classified human capital as general and specific; where he referred specific human capital/skills as on-the job training and general human capital as off-the job

training. In literature of human capital framework, employee skills, education and human capital are used interchangeably. Education is the most important factor of human capital (Schultz, 1993) but employee skills are also very crucial, as skills such as learning by doing develop the capacity to improve the existing skills and doing things in efficient way (Thompson, 2010; Koedinger *et al.*, 2015; Moye *et al.*, 2015; Kogan *et al.*, 2016).

Lall (1999) took a microeconomic view of human capital by emphasizing four major human capital concepts. *Stock of skills* (employee background, acquired trainings and technical skills); *labor force structure* (worker education and quality); *human capital accumulation* (adding on existing human stock by providing trainings) and *human capital losses* (employee turnover). From their analysis human capital can be classified into two parts: employee skill improvement, referring to the education and training related to industry specific knowledge and technological capacity development that accounts for skills and knowledge to specific technology (Lall, 1998).

It is also important to retain employees because firm is making investment with objective of gaining returns but once employee leave the organization then company need to acquire new employees and then again provide them training and education to build their skills. This will increase the cost of firm and results in losses on human capital. On the other, this also affects the competitive position of firm as company's stock of skills is reduced but at the same time competitors stocks of skills is increased (Ton and Huckman, 2008; Vivarelli, 2013; Mourshed *et al.*, 2014; Kaufman, 2015). This shows the importance of skills in human capital, following literature discusses the interaction between human capital and skills.

2.1.2   Human Capital and Skills

In literature human capital and skills are treated as same but still these are two distinct concepts. Skill is an unclear term (Green *et al.*, 1996). It refers to the ability or mastery to perform a given task, or, it can refer to behavioral characteristics such as ability to work without supervision, reliability to perform task and steadiness of job. Thus, skills can be described as necessary competencies needed to carry on job (Wu *et al.*, 2015), but (Bellack *et al.*, 2013) defined skills as a complex "social relation".

Cézard (1979) identified skills as "job skills" – the capabilities and competencies needed to perform a particular job or task; "workers' skills"- the knowledge of employees carried from their previous education and learning by doing on their job; and "conventional skills"- grouping of employees on the basis of distinct nature of work in conventional way. Felstead *et al.* (1999) identified skills as: the existing acquired human capital stock (Stevens, 1994); the workers' autonomy (Braverman, 1974); and the workers' efficiency to perform given tasks in a job (Primoff and Fine, 1988).

Selingo (2015) argues that formal education can be one way to acquire skills but the best way is to do work by oneself as when a person is performing a particular task then his mind and body are actually involved, therefore with the method of trial and error he learns from doing mistakes by not repeating next times (Thompson, 2010; Koedinger *et al.*, 2015; Moye *et al.*, 2015; Kogan *et al.*, 2016). This not only emphasizes the way of acquiring skills but also the training formation that coaching is one of the substitutes of formal training where employee is asked to perform a task on job and then guided by senior.

Lall (1998) relates skills to technology. He suggests that technological skills are not so simple and they require much more than just acquiring basic education and training. He argues that even a worker with best education and training may not be able to work efficiently unless he has technological skills. He believes that technological capabilities refer to the accumulated knowledge regarding job possessed by all the employees throughout their job tenure. Education and training may be related to a specific task but a job consists of many interrelated tasks, therefore just knowing own task may not be sufficient until a worker does not know the entire process.

Employees are internal customers (Goetsch and Davis, 2014), and they need to be satisfied in order to carry out ultimate objective successfully. This refers to the concept that in firm's operations, output of one worker becomes input of other; therefore unless first employee does not know the needs of other worker, quality cannot be achieved. So, technological skills are more about awareness of entire processes and tasks of a firm. As human skills are key determinants of quality of workers, so it is necessary to understand the relationship between human capital and firm performance. Following literature discusses the impact of human capital on firm performance.

2.1.3 Human Capital and Firm Performance

Becker, (1962) in his "Human Capital Theory" argues that there is positive relationship between human investment and firm performance. Human investment brings productivity which increases the profitability and relative benefit of human investment is higher than its cost. Human investment can be viewed as investment in acquiring well educated people, providing them trainings and developing their skills and providing them compensation to retain them so that human capital losses can be minimized by reducing employee turnover (Vomberg *et al.*, 2015).

Li *et al.* (2015) found that there is positive relationship between employee quality and innovation. Employees who are more productive are ready to take challenges and risks as they rely heavily on their skills and they believe that they will get success. Firms with quality labor on average generate more revenue and profitability compared to firms with low quality labor (Lins *et al.*, 2015). Lynch and Black (1995) used average education level of firm and average training cost as proxy for employee quality and found a positive relationship between average education and revenue productivity. They also found a positive relationship between average time and amount spent on training and employee productivity.

2.1.4 Human Capital-Theoretical Framework

Based on above literature of human capital, skills and firm performance, I derive following theoretical framework.

<insert figure 1 here>

Figure 1 shows that human capital consists of four broader concepts- stock of skills, labor force structure, human capital accumulation and loss of human capital. First two concepts depend upon acquiring employees who have very good academic backgrounds and skills, this leads to opportunity for firms to attract well qualified workers by offering them high wages compared to competitors. In past studies, average wage rate and salaries to sales ratio have been used as proxy for stock of skills. Third concept, human capital accumulation refers to developing skills by investing in employees with training and developing opportunities, total training expenses, training expense to sales, and average training expense per employee have been used as proxy for human capital accumulation. The last concept, loss of human capital refers to retaining key employees. Compensation and other benefits have been used as proxy for employee motivation and retention.

2.2 Hypotheses Development

On determinants of cash holdings, past studies have made significant contribution and have identified the transaction cost model, information asymmetries and agency cost as determinants of cash holdings. This study is based on the transaction cost model.

The conversion cost of asset liquidity leads to transaction cost model (Keynes, 1936). In (Modigliani and Miller, 1958) world of perfect capital market, short term liquidity such as cash holding is irrelevant. Since there are no transaction costs and information asymmetry, firms can raise capital when needed and in absence of liquidity premium firms do not bear opportunity cost on liquid assets. Considering these factors, the firm value is unaffected therefore firm's cash policy is irrelevant for managers. But in real world it is not always easy to finance when funds are required and there are transaction costs as well on both, converting illiquid assets into cash and raising funds from financial markets. This leads to firm preferences to hold more cash so that at time of needs, firm may not sacrifice the investment opportunities due to lack of funding.

<insert figure 2 here>

Tim Opler *et al.* (1999) show that optimal holdings of liquid assets depend upon trade-off between marginal cost of liquid assets and marginal cost of shortage of liquid assets, where marginal cost of liquid assets is independent of changes in liquid assets and marginal cost of liquid assets shortage is downward sloping. In case of shortage of liquid assets, firm can opt either investment or financing strategy. In investment strategy firm can sacrifice investment opportunities or reduce dividends, or alternatively firm can sell assets, on the other hand firm can also raise funds from financial markets under financing strategy. Shortage and cost of liquid assets are positively related, as greater shortage results in sacrificing profitable investments or

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raising funds at higher cost. In case of increase in marginal cost of liquid assets, the curve will shift to the right and firm will require more liquid assets to achieve optimal level.

Investment opportunities argument is consistent with the above discussion and transaction cost model, as a firm with increasing investment opportunities bears higher cost of shortage of cash as firm needs to sacrifice profitable opportunities and since the objective of any firm is to maximize the wealth of shareholders so giving up valuable investment opportunities means destroying firm value. In this case cost of not having cash to exploit investment opportunities is higher and this will have negative impact in long term as competitors will take benefit by making valuable investments and that results in negative market share, particularly when firm can get first mover advantage (Lieberman and Montgomery, 1988; Yung-Chang Hsiao *et al.*, 2015). Tim Opler *et al.* (1999) found a positive relationship between firm's cash holdings and investment opportunities which is consistent with the transaction cost model.

Based on the theoretical framework of human capital and cash holdings, I derive the conclusions that human capital variables (i.e. employee cost, employee efficiency, employee stock options and education index) have negative relationship with cash holdings, because a decrease in employee efficiency, education index and employee costs motivates firms to hold more cash whereas since there is positive relationship between employee stock options and cash flow as firms expect an inflow of cash at time of exercise of option (Ciccotello *et al.*, 2004) so more the number of employee stock options the more expectation of cash inflows, and firm hold less cash, therefore there is negative relationship between employee stock options and cash holdings (Babenko *et al.*, 2011). There is a positive relationship between human capital investment opportunities and human capital variables. The drop in values for employee cost, employee

efficiency, employee stock options and education index, results in increased investment opportunities for firm, and therefore firm needs to hold more cash that leads to a positive relationship between cash holdings and investment opportunities.

<insert figure 3 here>

Hypothesis 1: After controlling for firm specific variables, the sensitivity of human capital opportunities to cash holdings will be positive for foreign firms operating in developing countries.

Developing countries face problems like brain drain which leaves labor market that is less efficient in terms of human skills. This opens a competition within firms to acquire remaining workforce but when a foreign company enters in a developing country it hires high quality employees at higher wages, whereas domestic firms compete with other firms on low wage rate and lower quality employees (Rita Almeida, 2007). Many studies have found that foreign companies dominate domestic companies on factors like larger size, productivity and highly skilled employees with higher wages (Conyon *et al.*, 2002). Based on these arguments my second hypothesis is as follows;

Hypothesis 2: After controlling for firm specific variables, the sensitivity of human capital opportunities to cash holdings will be positive and stronger for foreign firms than for domestic firms.

Datta *et al.* (2005) found a significant difference in human resource policies across industries. Firms from labor intensive industries are more concerned about their labor related policies as labor costs contain major proportion of total cost. The output quality in labor intensive industries

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depends upon labor. Firms need to invest heavily in their human resources to increase labor productivity. Many firms focus on minimizing the human errors in operations to avoid losses. Past studies show that companies invest higher amounts on employee motivation in industries that demand high skills and employee commitment (Berman *et al.*, 1994; Bresnahan *et al.*, 1999; Noorbakhsh *et al.*, 2001).

Hypothesis 3: After controlling for firm specific variables, the sensitivity of human capital opportunities to cash holdings will be positive and stronger for labor-intensive firms than for capital-intensive firms.

Firm's financing policy also affects the level of cash holdings. Firms with higher level of debt face the risk of financial distress as at some stage of their business they may find it difficult to pay their financial obligations in due time (Wruck, 1990; Altman and Hotchkiss, 2010). Firms facing financial distress may have to pay higher cost of financing and may also lose some investment opportunities, as cost of capital may be higher than the return of projects. Financial distress also has negative impact on employees because their morale goes down, as in case of bankruptcy they will lose their jobs. This results in lower productivity which leads to poor performance (Tim C Opler and Titman, 1994). There is also higher employee turnover for financially distressed firms as job security is one of the major concerns for employees so as a proactive approach employees join other companies (Gilson, 1989). Considering these issues and distress cost, firms facing distress cost hold less cash and service its debt so that distress risk can be mitigated (Guney *et al.*, 2007). Based on above arguments my hypothesis is;

Hypothesis 4: After controlling for firm specific variables, the sensitivity of human capital opportunities to cash holdings will be positive and stronger for financially non distressed firms than for financially distressed firms.

Financially constrained firms maintain a higher level of cash because due to adverse selection and agency cost of debt, external financing is not only expensive but also difficult to find (Heitor Almeida *et al.*, 2011). For constrained firms, investments are sensitive to availability of internal funds as internal financing is cheapest source of financing (Stein, 2003; Franzoni, 2009; Joonil Lee *et al.*, 2016). Faulkender and Wang (2006) analyzed the marginal benefit of cash holdings and argued that for financially constrained firms marginal value of cash holdings is higher than financially unconstrained firms. Many MNEs prefer to finance their operations where firms are operating due to exchange rate hedging and financial policy. This creates challenges for MNEs listed in developing countries due to less developed financial markets comparedto developed countries (Cuervo-Cazurra and Genc, 2008). This argument provides incentives to MNEs to hold more cash when they feel there are more growth opportunities. Based on this literature my hypothesis is;

Hypothesis 5: After controlling for firm specific variables, the sensitivity of human capital opportunities to cash holdings will be positive and stronger for financially constrained firms than for unconstrained firms.

3 THE SAMPLE AND METHODOLOGY

This section contains the research methodology used to conduct this study. Subsection 3.1 consists of the overview of sample and data collection. Subsection 3.2 describes the dependent, independent and control variables. In subsection 3.3 I discuss the econometric models to test the hypotheses and finally, subsections 3.4 and 3.5 contain data and summary statistics respectively.

3.1 The Sample Overview

My sample is BRICS countries, namely, Brazil, Russia, India, China and South Africa. I select these countries for various reasons. Developing economies provide various opportunities to foreign firms in particular due to their strong human resource base.Samake and Yang (2011) argue that role of any country in global economy is determined by population, growth and trade and countries like China, India and Russia play major role in international trade as they are highly populated, growing at rapid pace and contribute heavily in international trade. Wilson and Purushothaman (2003) emphasize the importance of these countries in international trade by arguing that the increasing demand and spending in these countries will compensate the slow growth in developed economies and thus will attract multinational firms to invest. Moreover,McManus *et al.* (2009) argue that developing economies have higher earning potential due to lower cost structure, and thus motivate investors to invest by yielding higher returns at lower risk.

These arguments confirm the significance of these developing countries in international trade in particular BRICS countries, as the role of BRICS countries in global economy is important since the combined GDP of these countries contribute 31 percent in overall global GDP in 2015 and share in 1992 was only 17 percent. Moreover, IFM estimates that by 2017 share of BRICS will

be higher than that of G7[2] and by the end of 2020, the share of BRICS in global GDP will reach

to 33 percent while by 2030 the economic growth of BRICS countries will be more than that of

highly developed economies (IMF, 2016). The past two decades have observed a dramatic rise in

foreign direct investment (FDI) in developing economies. As China and India have achieved

high growth in last three decades with an annual growth of 10 percent and 6 percent respectively,

therefore both the countries have been achieving more attention of foreign investments.

<insert figure 6 and 7 here>

3.2 Data

The sample consists of publically traded foreign firms (MNEs) from BRICS economies for a

period of six years from 2010 to 2015 covering 11 sectors. I started my sample from 2010 to

overcome the effect of global financial crisis[3]. I exclude financial sector in this study because in

financial companies it is hard to evaluate the liquidity of firms. The final sample consists of 1838

firms with 11028 yearly observations. In my sample a foreign company is defined as a company

operating in developing economy with more than 51 percent ownership to foreign shareholders. I

select only those foreign companies which are having their ownership from developed

economies. The reason for selecting such companies is to exclude the effect of developing

economies. For example A Chinese Company operating in India or Russia is a foreign company

but financial policies of domestic and foreign firms may not have much difference since

ownership and control of both the companies is from developing economies. Therefore

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[2]Group of 7 countries which includes; United States, United Kingdom, Japan, Germany, Canada, France and Italy.
[3]I also performed the analysis from 2011 to 2015 to completely wipe out the effect of global financial crisis. But since there was

not major impact on results so I continue with 2010 to increase the sample size to have more robust results.

ownership of developing countries does not meet my definition of foreign company and thus are excluded from the sample. I use datastream and Orbis databases to collect firm specific data such as sales, assets, research and development expenditures, capital expenditure, cash flows and cost of employees. To collect the data for education index, I use official database of United Nations Development Programme (UNDP).

<center><insert Table 2 here></center>

3.3 Variables

This section describes the variables of this study. First I define the dependent variable and then discuss the variables to construct the human capital investment opportunities index and finally I discuss the control variables used in this study.

3.3.1 Dependent Variable

For my analysis, I consider cash and cash equivalents as liquid assets necessary to support day to day operations, which are closely associated to firm's sales. Therefore, I use cash and cash equivalents to sales ratio as primary measure of cash holdings (Harford *et al.*, 2012). Though not reported, I also use two other measures of corporate cash holdings suggested by past studies. First, I use Tim Opler *et al.* (1999) measure of cash holdings, which is given as cash and short term liquid assets to total net assets ratio, where net assets refer to total assets less cash and cash equivalents. Second, considering industry classification as an important determinant of corporate cash holdings, I use Harford *et al.* (2012) industry adjusted cash measure, calculated as the

difference of firm's and median industry cash to sales ratio. Both these cash holding measures give similar results to reported cash to sales ratio, which suggests the robustness of findings.

3.3.2   Explanatory Variable – Construction of Human Capital Investment Opportunities Index

Past studies have focused on relationship between firm performance and employee productivity. Following variables are used in literature as proxy for human capital which I use as components of index;

3.3.2.1   Employee Education

Employee education and training increase the employee productivity (Mahy *et al.*, 2015; de Castro *et al.*, 2016). Education increases the ability of an individual to decode the important information regarding cost of inputs and other process and at the same time it brings the flexibility in employees by being capable of adapting to new technological changes (Gallego and Beyer, 2013; de Castro *et al.*, 2016). Moreover, education itself serves as an indicator of need for further education and transferring education to skills by applying learnt concepts of activities performed on job(Judson, 1998).

Wozniak (1987) analyzed the relationship between education and adaptability to new technology. He found that more educated employees were able to adapt to new technology very quickly compared to employees with less education. Brynjolfsson *et al.* (2011) analyzed the performance of firms using data driven decision-making approach and found a positive relationship between employee education and adaptability to new system of decision-making. They argued that education contributes to technological innovation, more educated employees are more creative and they are proactive towards change and they try to bring new technology and processes not only to bring efficiency but also to get competitive advantage. As this study is based on developing countries therefore education level of employees and its quality is big

challenge for MNEs. To capture the education level and quality, I use education index as proxy. Low quality of education provides investment opportunities for firms to develop the skills of employees and make them more productive.

I use education index as proxy for educational level of available human capital in each country. Data on education index is only available till 2013, as since then UNDP has included education as part of HDI and there is separate publication of education index. Cahill (2005) found a correlation of 0.95 between education index and original HDI. Using his findings I assume that education index for 2014 and 2015 grows at same rate of HDI.

$$EI_{i,t} = EI_{i.t-1} \times g_{HDI_i,t}$$

Where EI is education index, i represents the country, t represents year (2014, 2015) and g represents growth in HDI of country i at time t.

3.3.2.2 *Employee Productivity*

Alison L Booth and Snower (1996) analyzed the relationship between employee skills and capital investments. They found that people who possess more skills they are better in making capital investments. They further analyzed that those who learn new skills make more productive decisions. Productive employees are key to firm's future and firms having employees with strong technical skills have competitive advantage as better skills reduce the barriers to entry where industry is technologically advanced (Danneels, 2015; Snieška and Drakšaitė, 2015). Employee productivity is measured in terms of average sales per employee(Kaplan and Norton, 1995; Huselid *et al.*, 1997; Harter *et al.*, 2002; Wagner, 2002; Belorgey *et al.*, 2006) and when employee efficiency is lower than average, then firms must provide training to their employees

to bring efficiency. This increase in training expenditure refers to human capital investment opportunities.

Based on above literature I use sales per employee as proxy for employee efficiency. I also use profit per employee and cash flow per employee as alternative measures of employee efficiency to capture HCI opportunities. The reason for using these variables is to account for employee contribution in adding value to shareholders.

3.3.2.3   *Employee Cost*

Motivated employees are more productive (Lin, 2007; Herzberg *et al.*, 2011). The amount of money invested in employees in terms of wages, compensations and other monetary benefits are key determinants of employee motivation. Majumdar (1998) used wage per worker as labor quality and found that firms with higher average wage are better than firms with lower average wage in exploiting the market opportunities and enhancing the scale of operations. Moreover, to meet the requirements of changing environment and technological advancements, companies keep providing trainings to employees to sustain competitive advantage (Konings and Vanormelingen, 2015; Guerrazzi, 2016). Cost-benefit analysis of human investment suggests that the marginal benefit of human investment is always higher than marginal cost as employees become more motivated and productive which provide incentives to firms (Blatter *et al.*, 2015). Based on past studies, I sum all the costs associated with employees as employee costs which include salaries, compensations, benefits, bonuses and trainings and development costs. I use average cost per employee as proxy for employee cost. Moreover, I also use cost of employee to sales ratio as an alternate proxy.

3.3.2.4 *Employee Stock Options*

In order to motivate employees and improve productivity, firms offer executive and non executive employee stock options plans. Non executive employee stock option plans help firms in attracting high quality workers (Lazear, 1986), increasing employee productivity (Sesil *et al.*, 2002; Hochberg and Lindsey, 2010; Kim and Ouimet, 2014), and retaining key employees (Ittner *et al.*, 2003; Oyer, 2004). Chang *et al.* (2015) analyzed the relationship between employee stock options and employee productivity. Empirical evidence shows that non executive employee stock options increase corporate innovation. When employee stock options are granted to employees they become more motivated, committed and productive. Normally employee stock options have longer maturities and to get most of it employees are motivated towards firm performance because they can only get benefit if share price increases (Core and Guay, 2001). This brings employees' attention towards firm's long term success and makes them more productive (Rajan and Zingales, 2000).

Fang *et al.* (2015) analyzed the relationship between employee stock options and Chinese firms. They found that firms with employee stock plans yield more ROE compared to firms without option plans. They also found a positive relationship between employee stock options and factor productivity, which is consistent with previous studies that employee stock option plans induce the employee motivation and commitment.

Considering the features of employee stock options, an employee stock option can only be exercised if it is in the money and benefit per option will be same for all employees but total benefit depends upon number of options held by each employee. Therefore I use average options per employee as proxy for employee stock plan. A higher proportion suggests more employees can get benefit of this compensation plan.

From above discussion I derive employee cost, employee efficiency, employee stock options and education index as four major components of human capital investment opportunities. First, firms with lower average cost per employee have incentives to increase their compensations in terms of salaries, trainings and other benefits. Second, firms with low efficiency measured as sales per employee can invest on developing capacities of employees by providing them trainings. Third, firms with lower employee stock options[4] can issue more options to motivate their employees. Fourth, lower human development index suggests that there is need to invest in human capital because labor in that region is not well equipped as it should be to achieve desired level of efficiency.

Since all these variables are correlated with each other, so based on these variables, I use principal component analysis (PCA) to construct HCI opportunities index[5]. PCA controls the multicollinearity problems (Florackis and Ozkan, 2009) and it automatically produces the weights for each component by capturing the highest variance from covariance matrix of all variables.

$$HCIO_{Index} = (x_1 \text{x EE}) + (x_2 \text{x EC}) + (x_3 \text{x} ESO) + (x_4 \text{x} EI) \qquad \textbf{Equation (1)}$$

Where, x_1, x_2, x_3 and x_4 represents the coefficients of Employee Efficiency (EE), Employee Cost (EC), Employee Stock Options (ESO), and Education Index (EI) respectively. Employee

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[4]In order get impact of non executive employees, I use non executive employee stock options.

[5]In order to correctly identify the relationship between HCI opportunities and variables used to proxy these opportunities I reverse the relationship by using reciprocals of each variable. Reason for this is a lower value of each variable represents the higher opportunities therefore by using reciprocal a higher value will mean higher opportunities.

efficiency is defined as logarithm of sales per employee, employee cost is defined as logarithm of average cost per employee, employee stock options is defined as logarithm of average options per employee and education index is defined as country specific index provided by UNDP.

<insertfigure4 here>

3.3.3 Control Variables

Following Tim Opler *et al.* (1999) and Bates *et al.* (2009), I use following variables as additional determinants of cash holdings to control company related characteristics in my regression analysis. These variables include *size of firm*; measured as logarithm of total assets, *financial leverage*; measured as total debt to total asset ratio, *working capital*; measured as current assets excluding cash, marketable securities and current liabilities to total assets, *cash flow*; measured as cash flow to total assets, *cash flow volatility*; measured as deviation of firm's cash flow to asset ratio from its past five years' average, *research and development*; measured as R&D expenditure to sales ratio, *capital expenditure*; measured as long term investments to total assets, *market to book ratio*[6]; measured as market value of equity divided by book value of equity, *dividend policy*; measured as a dummy variable, which takes a value of one if firm pays dividend to common stockholders and zero otherwise.

<insert figure 5 here>

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[6]Since market to book ratio suggests the investment opportunities so I do not include market to book ratio in my original model, rather it is used as alternative method for investment opportunities for robustness check.

3.4 Econometric Model Specification

In order to test my hypotheses, first I use pooled regression but since data is unbalanced[7] and there are no proxies for industry[8] effects so simple pooling may lead to inefficient or biased parameter estimates. To overcome this problem, I use fixed effect model which allows intercept to vary across time or/and firms. This changing intercept helps in capturing the effects of omitted variable bias. However, Cheng Hsiao (1986) identifies that if data set contains measurement error then the results of the fixed effects model can be more biased than pooled regression model. Considering this, I use both the pooled OLS and fixed effects model[9].

Based on discussion in section 3.1, I estimate the following model,

$$Cash_{i,t} = \beta_0 + \beta_1 FSIZE_{i,t} + \beta_2 FLEVRG_{i,t} + \beta_3 CF_{i,t} + \beta_4 VARCF_{i,t} + \beta_5 NWC_{i,t} +$$

$$\beta_6 CAPEX_{i,t} + \beta_7 DP_{i,t} + \beta_8 R\&D_{i,t} + \beta_9 HCIOI_{i,t} + \varepsilon_{i,t} \qquad \textbf{Equation (2)}$$

Where cash is defined as cash to sales ratio for firm i at time t, whereas explanatory variables are discussed earlier.

<insert Table 1 here>

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[7] Number of observations for each firm is different.

[8] Eventhough I use industry dummies to capture industry effects but following Booth et al. (2001) I also use fixed effects model.

[9] Random model is an alternate model that can also be used but the Hausman (1987) test suggests that fixed effects model is more appropriate for given dataset.

In order to test country effect in my model I use the approach adopted by Laurence Booth *et al.* (2001)and Al-Najjar (2013)[10]

$$Cash_{i,t} = \beta_0 + \beta_1 FSIZE_{i,t} + \beta_2 FLEVRG_{i,t} + \beta_3 CF_{i,t} + \beta_4 VARCF_{i,t} + \beta_5 NWC_{i,t} +$$

$$\beta_6 CAPEX_{i,t} + \beta_7 DP_{i,t} + \beta_8 R\&D_{i,t} + \beta_9 HCIOI_{i,t} + \eta \sum D_{i,t} + \varepsilon_{i,t} \qquad \textbf{Equation (3)}$$

All other variables are same and the additional variable $D_{i,t}$ represents vector of dummy variables for each country in sample. These models may observe endogeneity issues and to overcome this problem I use instrumental variables (for more details, see section 4.3).

Finally[11], in order to check the cross sectional relationship between HCIOI and cash holdings across firms, industry and country, I follow the approach of Ghaly *et al.* (2015).

$$Cash_i = \beta_0 + \beta_1 FSIZE_i + \beta_2 FLEVRG_i + \beta_3 CF_i + \beta_4 VARCF_i + \beta_5 NWC_i +$$

$$\beta_6 CAPEX_i + \beta_7 DP_i + \beta_8 R\&D_i + \beta_9 HCIOI_i + \varepsilon_i \qquad \textbf{Equation (4)}$$

where each variable represents the averages, for example for firm specific cross sectional data, I take time series averages of all the variables in model. For industry effects averages are taken accordingly.

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[10] Booth et al. (2001) examined the capital structure decisions in developing countries whereas Basil Al-Najjar (2011) examined the financial determinants of cash holdings in emerging markets.

[11] The main reason for cross sectional differences was that results show that the main variable of interest (HCIOI) shows very little time variation. Since it does not vary across time, so my focus is more on cross sectional relationship between cash holdings and HCIOI.

3.5   Summary Statistics

Table 3 shows summary statistics for all the variables in sample. Panel A reports the average cash holdings[12] of each country and overall sample which shows that11.3 percent of total assets of foreign firms comprise cash and cash equivalents. This percentage is higher than corporate cash holdings in developed countries such as US and UK, where average cash holdings are reported as 6% and 8% respectively (Dittmar and Mahrt-Smith, 2007). This shows that on average firms hold more cash in developing economies than in developed economies. Moreover foreign firms hold more cash compared to domestic firms as Al-Najjar (2013) found that on average in emerging markets domestic firms hold 5% of total assets. The difference in results may be due to difference in sample size, selected firms, time period and countries in the sample but overall slight higher cash holdings suggest that foreign firms want to capitalize on available investment opportunities. Moreover firms operating in China hold the most cash holdings in my sample with 14.4 percent compared to India, Russia, South Africa, and Brazil with cash holdings of 11.8, 10.7, 10.2 and 9.17 percent respectively. .

<insert Table:3 Panel-A here>

Panel B reports the summary statistics of variables on human capital. Results show that the average cost spent on employees is higher in India than other countries in the sample with 0.25 percent of sales. Whereas employees in Russia are more efficient with average sales per

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[12]In summary statistics I use cash to assets ratio to compare with past studies but in my regression model I use cash to sales ratio as dependent variable but in unreported results I also use cash to assets ratio and findings show that the impact of HCIOI on cash holdings is still positive and significant

employee of 396 dollars and cash flow per employee of 39.51 dollars. China has the least average cash flow per employee of 23.49 dollars. Brazil outperforms other countries on profit per employee and employee cost turnover with 25.84 dollars and 10.26 times respectively. In terms of education quality Russia is the best among five countries with an average education index of 0.782, while India has the least education index of 0.461. This suggests there is no particular country which dominates other countries in all the human capital components.

This also shows the importance of constructing the index, as one firm may dominate other firms in one area but may be far behind in other human capital specific variables. Therefore by assigning the weights to each factor on the basis of its importance, help in comparing the firms and then identifying the overall impact of human capital on firm specific variable. And based on HCIOI, table shows that China and India have more human capital investment opportunities in the sample with an average HCIOI of 0.19 and 0.17 respectively, which is higher than the average overall HOICI of 0.156. Average HOIC for Brazil and Russia are below average HCIOI with 0.11 and 0.15 respectively. This suggests that firms operating in China and India face more opportunities related to human capital.

<insert Table:3 Panel-B, C & D here>

Panel E shows the correlation matrix which shows that correlation between cash holdings and HCIOI is positive and significant. Moreover, results show that variable of interest, HCIOI is uncorrelated with control variables. In order to test multicollinearity, I calculated variance

inflation factors and VIF for all the variables remained well below 10 which shows there is no multicollinearity problem in data (Neter *et al.*, 1990).

<insert Table:3 Panel-E here>

Table 4 compares the summary statistics of positive HCIOI firms and negative HCIOI firms. Since the positive score suggests high HCI opportunities so results show that firms with positive HCIOI hold an average 0.133 percent cash which is 0.9 percent higher than firms with negative HCIOI score and 0.45 percent higher than average cash holdings of overall sample. The difference in means of positive and negative score firms is significant at 1 percent.

<insert Table:4 here>

4   EMPIRICAL RESULTS

This section of report contains the results of my investigation of the impact of human capital investment opportunities on cash holdings of foreign firms operating in developing economies. In subsection 4.1, I present my main findings. Subsection 4.2 consists of additional analysis on role of other firm specific factors that may affect our main results. These factors include competition between domestic and foreign firms, labor intensive versus capital intensive industry, financial distress and financial constraints. Subsection 4.3 contains findings of various robustness tests first to address endogeneity concerns and then some alternative measures of human capital investment opportunities.

4.1   Cash Holdings and Human Capital Investment Opportunities Index

Table 5 reports the findings of Pooled OLS and fixed effect regressions for each country. I use year and industry dummies in pooled regressions to capture the time and industry effects. To avoid the problems of potential outliers I use winsorized[13] variables. Reported p-values are based on heteroscedasticity-robust standard errors[14]. Results show that the impact of HCIOI is positive and highly significant for each county in my sample. The highest magnitude (0.303) of coefficient HCIOI for China suggests that the impact on HCI opportunities on cash holdings is higher for foreign firms operating in China are facing more human capital investment opportunities and summary statistics also confirms this result as China has lower efficiency ratio and education index is also lower compared to Brazil, Russia and South Africa. India stands the second with coefficient of 0.269 and this is also consistent with summary statistics as India has highest cost to sales ratio but still unable to get efficiency from workers, since efficiency

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[13]Charles P. Winsor was first to give the concept of winsorization to deal with extreme values for robust estimators, following that I winsorize at 1st and 99th percentiles

[14] Firm level clusters in standard errors are used.

measures such as sales per employee, cash flow per employee, profit per employee and employee costs turnover are lower compared to other countries and at the same time it has the lowest education index in the sample.

These findings also confirm the HCIO-cash holdings relationship as results prove that the impact of human capital opportunities are more on China and India and summary statistics confirm that firms in these two countries hold the most cash compared to firms in other developing countries. Moreover, the average HCIOI is also higher for firms operating in China and India. This suggests that due to higher human capital investment opportunities firms hold more cash.

Table 6 represents the findings of overall impact of HCIOI on cash holdings of foreign firms in BRICS countries. Model 1-3 presents the findings of OLS regressions. In model 1 and model 4, I only use control variables mentioned in section 3.1.2 as explanatory variables using pooled and fixed effects regressions respectively to find whether coefficients of these determinants are consistent with past studies (Olper et al., 1999; Bates et al., 2009). Results show that firm size, financial leverage, capital expenditure, cash flow, dividend policy and net working capital have negative coefficients whereas cash flow volatility and R&D have positive coefficients. All coefficients except R&D are significant.

The negative impact of firm size on cash holdings suggests that large firms are less prone to risk and their operations are stable, consequently firm hold less cash (Opler et al., (1999); Harford et al., (2012). Moreover, firms generating more cash flows hold lower level of cash because cash holdings are proxy for liquidity and cash flows are substitute of cash holdings. Firms with ability to generate higher cash flows are confident about their liquidity positions and consequently hold

less cash. Firms with higher volatility in cash flows hold more cash; this result is consistent with the findings of (Han and Qiu, 2007). Firms with higher cash flow volatility cannot depend upon the cash flow generation because it might affect firm's liquidity. As developing economies face instability in macroeconomic indicators such as economic growth, interest rates, inflation etc. that also affect the purchasing power of customers which leads to volatility in firms sales and consequently cash flows. The negative relationship between firm's short term liquidity and cash holdings shows that firms with higher liquidity needs less amount of cash. Moreover, there is a negative relationship between cash holdings of foreign firms and leverage. This shows that firms with high debt obligations need to pay for interest payments and also to reduce agency cost of debt, so they make payments to service their debt. The negative relationship between dividend dummy and cash holdings suggests that in order to make dividend payments firms make cash payments which reduces cash reserves and firms with dividend policy of not paying dividend to shareholder can hold more cash.

Only R&D variable is insignificant, which is also consistent with study of (Un and Cuervo-Cazurra, 2008) as foreign firms have access to quality knowledge and technology; therefore they invest less in R&D than domestic firms. Secondly foreign firms invest more in internal R&D than external R&D, this acts as substitute to external R&D because foreign firms are having headquarters in other countries and they heavily invest in R&D and then transfer knowledge and technology to subsidiaries working in other countries.

<insert Table 6 here>

Model 2, 3 and 5 present the results of regression where I use HCIOI as an additional regressor in model 1. The only difference between model 2 and 3 is that in model 3 I use countries dummies whereas model 5 is estimated using fixed effects. Results show that even controlling for time, firm and country effects the human investment opportunity index has a positive and highly significant coefficient. This shows that investment opportunities in human capital positively influence the cash holdings of foreign firms. Moreover, control variables when combined with HCIOI still carry same signs for coefficients. This suggests that relationship between HCIOI and cash holdings is independent of correlation between HCIOI and control variables. Reported p-value suggests that results of relation between cash holdings and HCIOI are statistically significant at 1% level.

Model 6 reports the results of cross sectional test on the relationship between cash holdings and HCIOI across firms. First, I convert all the variables in cross sectional by taking average of all the firms for previous years and then regress averages of cash for each firm on averages of HCIOI and other control variables. The positive and significant coefficient of HCIOI shows that there is cross sectional relationship between cash holdings and HCIOI. Model 7 reports the results of cross sectional test on the relationship between cash holdings and HCIOI across industry. I use same methodology as in model three but here I take industry averages than firm averages. Results show a positive and significant coefficient for HCIOI which suggests that HCIOI affects to different industries.

In model 8, I use Fama-MacBeth regression which also gives a positive and significant coefficient of HCIOI. I also use two additional analyses[15], first I use all components of HCIOI as regressors in model 2 and found that three of them are significant. Second, since education index is country specific variable so it might affect cash holdings and HCIOI simultaneously, so I use education index as additional explanatory variable and found both educational index and HCIOI as significant.

Overall, my findings are consistent and there is little change in magnitude of coefficient of HCIOI across all the models which suggest that the human capital investment opportunity index has a positive and highly significant effect on cash holdings of foreign firm. This confirms the findings of (Rita Almeida, 2007; Klasa *et al.*, 2009; Schmalz, 2013; Ghaly *et al.*, 2015). Results of this study are also consistent with stakeholder theory which identifies that the stakeholders such as employees, suppliers and customers influence the firms' financial policy and firms get employee commitment by maintaining substantial financial resources, as employees believe that they will get benefits from these resources as firm will invest for their welfare (Cornell and Shapiro, 1987).

Foreign firms operating in developing countries face more competitive labor markets than in developed economies due to lower level of education and low quality of workforce. Since the main objective of these firms is to get higher returns and this cannot be achieved without quality employees. Considering this long term objective foreign firms invest heavily on human capital and hire the most talented employees by offering them higher wages and continuously investing for their welfare to get their motivation and commitment. In case of failure of firm's commitment for employee welfare by not providing those benefits and opportunities that it has promised for

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[15] Additional results are not reported.

self-development and career growth will make employees dissatisfied. This will result in employee turnover and a negative image of company in market. Once these employees are hired then firm continuously invest on training and development programs in order to improve their skills and to get competitive advantage over other firms by having better stock of skills. Since firm's management is custodian of all the stakeholders, so employee turnover will convey a negative message that management is not good in dealing the stakeholders and this will result in decreasing implicit claims on new investment which in turn will lower the potential cash flows to firm and consequently firm value will fall (Cornell and Shapiro, 1987; Brown and Matsa, 2015). Therefore in order to minimize the loss of human capital caused by employee turnover, foreign firms also invest on employee retention by offering high benefits. On the other hand as human resource is key factor of production and it also provides competitive edge to firms, therefore companies with better policies for employee welfare get competitive advantage in operational activities which helps in increasing the shareholders' wealth (Edmans, 2012; Ertugrul, 2013; Ghaly *et al.*, 2015).

4.2 Why Do Higher Human Capital Investment Opportunities Lead to Higher Cash Holdings?

This section contains the results and discussion about additional tests to validate the relationship between cash holdings and human capital investment opportunities. As the positive influence of HCIOI on cash holdings is consistent with stakeholder theory, so it is also important to see that how this relationship is affected by the different factors which are directly related to firm's

financing and investment policies[16] such as i) competition between foreign and domestic firms ii) industry structure; whether firm operates in capital intensive or labor intensive industry, iii) firm financial position; whether firm is financially distressed or non-distressed, and iv) firm's financing capabilities; whether firm is facing constraints or not in raising new funds.

4.2.1   Human Capital Investment Opportunities and Competition between Foreign and Domestic Firms

Firstly, I investigate the impact of human capital investment opportunities on cash holdings for foreign versus domestic firms. I take sample of 2103 domestic firms from same BRICS countries where sample for foreign countries is taken. Table 7 shows the results for both domestic and foreign firms. Model 1 and 3 reports the results of foreign firms using pooled and fixed effects regressions respectively. Whereas the results of pooled and fixed effects regressions for domestic firms are reported in model 2 and 4 respectively. Results show that the HCIOI coefficient is positive and significant for both foreign and domestic firms but the magnitude for foreign firms is higher than domestic firms. The difference between coefficients of HCIOI for foreign and domestic firms is significant at 5 percent level. This suggests that the impact of human capital investment opportunities on cash holdings is stronger for foreign firms than for domestic firms. The reason for positive relationship is that foreign companies acquire more educated and highly skilled employees at higher wages, whereas domestic firms compete with other firms on low wage rate and lower quality employees. Since HCIOI is significant for both domestic and foreign firms so this shows the trade-off between types of investments made on human capital. These findings are consistent with the study of Rita Almeida (2007) which suggests that foreign firms acquire more skilled workers and their mental capabilities are good so they are quick learners

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[16] Corporate Governance may be another factor that might affect the relation between cash holdings and HCIOI. But I do not include that component in my analysis due to time limitations.

and productive therefore they require less amount of trainings compared to those with less mental capabilities. This results in access of domestic firms to less skilled workers therefore they invest more on trainings of existing workforce to improve their skills to bring the efficiency in operations to reduce the cost and improve the profitability. Therefore opportunity cost of developing skills of existing workforce for domestic firms is higher than foreign firms. Descriptive statistics show that on average foreign firms pay 25 percent higher salaries[17] than domestic firms, whereas there is not much significant difference in trainings and development expenditure. This suggests a tradeoff between salaries expenses and training and development expenses for domestic firms explaining that in developing economies on average foreign firms invest more on salaries where as domestic firms pay less salaries but invest more on training and development expenses.

<insert Table 7 here>

4.2.2   Human Capital Investment Opportunities and Industry Structure

Next, I investigate the role of industry type on relationship between cash holdings and HCIOI. I first categorize the foreign firms on the basis of labor intensive[18] and capital intensive. Then use separate regression analysis for both the categories of firms. Table 8 shows the results[19] for both labor intensive and capital intensive firms. The coefficient of HCIOI is positive and significant

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[17] As total costs of employees are used in study which is sum total of all the expenses related to employees. This is not reported but analyzed separately to check the differences between two different expenses.

[18] Following Ertugrul (2013), firms from high-tech, communications, mining, hotel are considered as labor intensive

[19] Model 1 reports pooled OLS and Model 3 reports results of fixed effects model for labor intensive firms, while Model 2 reports pooled OLS and Model 4 reports results of fixed effects model for capital intensive firms.

for both labor intensive and capital intensive firms but a higher magnitude of coefficient for labor intensive firms suggest that impact of HCIOI has stronger impact on labor intensive firms. The difference between coefficients of HCIOI for labor intensive and capital intensive firms is significant at 5 percent level. This suggests that the impact of human capital investment opportunities on cash holdings is stronger for labor intensive firms than for capital intensive firms. The reason for such relationship is that the labor intensive industries rely heavily on labor force to produce their output and high proportion of resources is related to labor. In such industries human resource practices are of great importance as labor cost is even more significant than the capital cost. Therefore firms invest heavily on human capital to improve their productivity and firm performance.

As this study focuses on developing countries, so there are various reasons which make labor intensive industries more attractive to foreign firms and since the return on these industries is higher so there is incentive to foreign firms to invest on human skills and consequently hold more cash. These reasons include; as in labor intensive industries major proportion of cost is variable, so this gives great advantage to firms of having lower business risk[20] which leads to higher earning potential. Due to problems of infrastructure and other support facilities in developing economies, labor intensive industries are more profitable for foreign firms with higher return on investments (Asiedu, 2002). Labor intensive industries also provide flexibility to foreign firms as due to involvement of lower capital cost, in case of failure of business, firm can easily shut down the business as shut down cost is less for labor intensive firms than capital intensive (Bernard and Jensen, 2007). One key difference between labor intensive and capital

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[20] Business risk is measured as operating leverage, since the fixed cost is lower therefore labor intensive industries face lower business risk than capital intensive industries.

industries is economies of scale. Labor intensive industries have the disadvantage of limited economies of scale as firms cannot reduce the wages of workers by adding more workers. Therefore when firm grows, it must need to employ more employees and given that the supply of quality workers in developing economies is short therefore firms must invest heavily to keep their employees motivated.

<insert Table 8 here>

4.2.3 Human Capital Investment Opportunities and the Role of Financial Distress

Next, I investigate the role of firms' financial position on relation between cash holdings and HCIOI. I first categorize the foreign firms into distressed and non-distressed firms by using Altman z score. A score of more than 3 suggests a strong position of firm whereas a score of less than 1.81 suggests a distressed position. Based on this I categorize financial distressed firms with z score 1.81 or below and rest were categorized as non-distressed firms. Then I use a separate regression analysis for both the categories of firms. Table 9 shows the results [21] for both distressed and non-distressed firms where the coefficient of HCIOI for non-distressed firm is positive and significant whereas it is insignificant for distressed firms. The difference between coefficients of HCIOI for non-distressed and distressed firms is significant at 5 percent level.

This finding confirms the studies of (Gilson, 1989; Tim C Opler and Titman, 1994; Guney *et al.*, 2007). The main reason for stronger relationship between HCIOI and cash holdings for financially non-distressed foreign firms is that distressed firms will utilize the excess cash in servicing the debt to avoid the distress costs. Therefore the opportunity cost of not making

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[21] Model 1 reports pooled OLS and Model 3 reports results of fixed effects model for non-distressed firms, while the Model 2 reports pooled OLS and Model 4 reports results of fixed effects model for distressed firms

payments for debt is higher and consequently distressed firms prefer to service debt from that, which results in lower cash holdings. Therefore the relationship between investment opportunities and cash will be weaker for firms facing higher growth opportunities and risk of distress simultaneously. Firms' this approach is to avoid the potential costs associated with financing distress. These problems may include higher financing costs which will affect their investment opportunities as firm may give up important projects.

Concerning to human capital, firm may give up important training and development programs which will have a negative effect on employee productivity and firm performance. On the other hand employees of financially distressed firms work under threat of losing their jobs as firm may go bankrupt which affect their productivity as employees show more commitment when they have job security (Tett and Meyer, 1993; Yousef, 1998; Mowday *et al.*, 2013). As a result of this there may be high employee turnover as employees will prefer to do job where their future is secure (Alam, 2015; Taylor, 2016). And in order to minimize the loss of human capital firms must retain the employees because firm is making the investment with objective of gaining returns but once employee leave the organization then company need to acquire new employees and then again provide them training and education to build their skills. This will increase the cost of firm and results in losses on human capital. On the other this also affects the competitive position of firm as company's stock of skills is reduced but at the same time competitors' stocks of skills is increased (Griffeth *et al.*, 2000; Ton and Huckman, 2008).

<insert Table 9 here>

4.2.4 Human Capital Investment Opportunities and the Role of Financial Constraints

Next, I investigate the role of firms' ability to raise new funds on relation between HCIOI and cash holdings of foreign firms. Since the relationship of cash holdings and HCIOI is only significant to non-distressed firms, so further analysis is restricted to financially non-distressed firms only. By using (Whited and Wu, 2006) index[22] I categorize the firms into financially constrained and unconstrained. Firms with WW index score of above (below) median are categorized as constrained (unconstrained). Table 10 shows the results[23] for both constrained and unconstrained foreign firms, where the coefficient of HCIOI for non-distressed financially constrained firms is positive and significant whereas it is weakly significant at 10 percent for unconstrained foreign firms. The difference between coefficients of HCIOI for constrained and unconstrained firms is significant at 5 percent level.

These findings are consistent with past studies of (Heitor Almeida *et al.*, 2004; Faulkender and Wang, 2006) as financially constrained firms maintain a higher level of cash because due to adverse selection and agency cost of debt external financing is expensive, which may result in giving up valuable investments. This is also consistent with findings of (Stein, 2003; Franzoni, 2009) that the spending patterns of financially constrained firms depend upon the availability of internal funds than on outcome of projects in terms of value creation. Capital structure decisions significantly vary across firms in developing countries (Laurence Booth *et al.*, 2001), many foreign firms prefer to finance their operations where firms are operating due to exchange rate hedging and financial policy. Operating in developing countries may itself be a constraint for

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[22]"The Whited and Wu (2006) provided index for constrained firms. As per their findings index = −0.0910(Cash Flow) − 0.0620 (Dividend Dummy) + 0.0210 (Long Term Debt) − 0.0440 (Firm Size) + 0.1020 (Industry Sales Growth) − 0.0350 (Firm Sales Growth)".

[23] Model 1 reports pooled OLS and Model 3 reports results of fixed effects model for financially constrained firms, while Model 2 reports pooled OLS and Model 4 reports results of fixed effects model for financially unconstrained firms

foreign firms due to less developed financial markets (Cuervo-Cazurra and Genc, 2008). This argument provides incentives to MNEs to hold more cash when they feel there are more growth opportunities. Secondly, the marginal value of cash for constrained firms is higher than unconstrained firms (Faulkender and Wang, 2006). So it makes sense that the relationship between cash holdings and HCIOI is stronger for financially constrained firms.

<insert Table 10 here>

4.3   Robustness Tests

This section consists of findings from various robustness tests to confirm the positive relationship between cash holdings and human capital investment opportunities. Subsection 4.3.1 reports the results and discussion on the findings of two stage least squares that help to overcome the problem of endogeneity about the HCIOI. I next discuss the findings of various tests using alternative measures for human capital investment opportunities.

4.3.1   Endogeneity Concerns over the Human Capital Opportunity Index

Ordinary Least Squares (OLS) assumes that all variables on right hand side are exogenous. This means that explanatory variables are uncorrelated with unobservable variables. Since error term captures the effect of all the unobservable variables, so if HCIOI is correlated with error term then this will not only lead to omitted variable bias but also undermine the robustness of the findings of the study as estimators will be inconsistent. There may be spurious correlation due to some unobservable variables which are related to HCIOI and also determine the cash holdings. For example, companies with very good financial performance can offer higher wages regardless

of employee quality and there may also be the case that a firm belongs to industry where average wage rate is higher. It is also possible that firm's cash policy is independent of human capital investment; in contrast, excess cash provide the luxury to firms to investment in employee welfare (Hong *et al.*, 2012).

To overcome the problem of endogeneity, first there is need to find the instrumental variables for HCIOI which are positively correlated with HCIOI and uncorrelated with error term and then performing the robustness test. Based on past studies I found firm and industry specific instrumental variables. Following Majumdar (1998), I use employee cost turnover ratio[24] as firm specific instrument. The intuition behind using this variable as instrumental variable is that; firstly it includes all the costs invested on human capital including salaries, training, compensations and other benefits; secondly, it captures both the impacts of cost and efficiency of employees. Using this relationship, we can see that both employee cost and productivity are in direct relationship, if cost per employee increases then employee efficiency will also increase. It might be the case that two firms are having same employee expense to sales ratio but there is trade-off between employee cost and productivity. My industry specific instrumental variable is industry average cost of employee, which I calculate as total costs associated to employees divided by total number of employees in a specific industry. Incorporating industry wage resolves the issue of missing data for employee cost and firm specific wage may define the variation in firm cash holdings but it is unlikely that industry wage does so. Finally I use country dummies[25]as instrument for HCIOI.

<insert Table 11 here>

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[24] Sales/Cost of Employees = Employee Cost x Employee efficiency
  Sales/Cost of Employees = (Employees/Cost of Employee) x (Sales/Employees)
[25] I use China as reference country.

Table 11 reports the results of two stage least square (2SLS) regression. Since there are three instrumental variables from literature for HCIOI, so first I use these variables separately and then I use all the variables collectively. In model 1, 2 and 3 results of first stage regression illustrate that the relationship between instruments and HCIOI is positive. Findings of second stage least squares confirm that there is positive relationship between HCIOI and cash holdings which suggests the robustness of results. Findings show that 2SLS gives a higher coefficient for HCIOI than that of OLS. The adjusted R-squared using TSLS regressions is higher than OLS which suggests that after controlling for engogienty the overall fit of model improves.

Then in model 4, I use all three instrumental variables together, in order to test the reliability of instrumental variables in terms of being uncorrelated with error term. I perform the test of over-identifying restrictions. A J-statistics of 0.22 suggests that we cannot reject the null hypothesis that instrumental variables are exogenous. The result in model 4 suggests that there is positive and significant relationship between HCIOI and cash holdings, which is consistent with my all previous findings.

4.3.2 Alternative Measures of Human Capital Investment opportunities Index (HCIOI)

Next, to test the robustness of results further, I perform two additional analyses by taking alternative measures for HCIOI. First I use two firm-specific HCIOI by excluding the education index from HCIOI and second index based on employee cost and productivity. The reason for taking these two variables as direct measures of human capital because employee stock options may not have significant effect on human capital since the benefit of employee stock options is hard to know as it is only prediction about future expected stock prices. And employee may not give much importance to employee stock options as they know they need to keep this stock for

specified time to exercise. Therefore employee cost and productivity are direct firm specific measures for human capital.

<center><insert Table 12 here></center>

Table 12 reports the results of modified HCIOI where Model 1 and 3 show the findings of $HCIOI_1$ based on three firm specific variables. Model 2 and 4 report the results of $HCIOI_2$ based on employee efficiency and employee productivity. Findings show that these two modified index still hold same positive and significant relationship with cash holdings but as I reduce the variables from main HCIOI, the magnitude of coefficient is decreased which suggests the importance of inclusion of other factors, as by including all the components of human capital in index give better proxy for human capital investment opportunities. The variable of education index is highly significant and negative. This shows that if education index drops, firms face more HCI opportunities and need to hold more cash. Moreover, in additional analysis I find that with firm specific index, the coefficient of HOICI for Brazil, Russia and South Africa is higher than China and India. This shows the impact of education index as China and India have comparatively lower education index. Therefore companies need to invest more on their skills development to achieve productivity and higher returns.

Next, I use profit per employee and cash flow per employee as alternative measures[26] of employee efficiency to capture HCI opportunities. The reason for using these variables is to account for employee contribution in adding value to shareholders. As, sales does not give any idea about overall outcome of operations, so using these measures can also focus on end results.

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[26]In order to save space, I do not report the results of this additional analysis.

Findings show that even using cash flows and profitability as efficiency measures, the impact of HCI opportunities on cash is still positive and significant.

Next, I use Market value of equity to book value of equity ratio as proxy for growth opportunities for foreign firms. Past studies have found a positive relationship between investment opportunities and cash holdings and these opportunities represent both capital and human investment opportunities, so we can proxy for HCIOI and argue that these growth opportunities will have a positive relationship with cash holdings. Table 13 reports the results of alternate measures of HCIOI where model 3 and 4 show a positive and significant coefficient for market to book ratio. This suggests that firms with higher investment opportunities hold more cash. This is also consistent with transaction cost model of cash holdings, as a firm with increasing investment opportunities bears higher cost of shortage of cash as firm need to sacrifice profitable opportunities and since the objective of any firm is to maximize the wealth of shareholders so giving up valuable investment opportunities means destroying firm value. Next, based on past studies I take employee cost to efficiency ratio as proxy for HCIOI. Model 2 and 4 report the results of pooled and fixed effect models respectively and results show that there is positive and significant effect of this alternate proxy on cash holdings. The reason for this relationship is need for improvement, as a higher ratio suggests that costs paid to employees do not bring desired results in terms of efficiency, so firms may invest on their skills so that they are more productive.

<insert Table 13 here>

5 CONCLUSION

When foreign firms decide to operate in developing economies, do they only care about capital investment or they do care about human capital investment opportunities as well? To answer this I investigate whether human capital investment opportunities in developing economies motivate foreign firms to hold more cash. Foreign firms operating in developing countries face more competitive labor markets than in developed economies due to lower level of education and quality of workforce. Since the main objective of these firms is to get higher returns and this cannot be achieved without quality employees. Second, due to high competition in labor market and firm's changing nature, maintaining high quality employees have become vital to success of firms. This leads to need for investing in human capital by providing them incentives to become more efficient. On the other hand stakeholder theory suggests that firms must fulfill implied promises to their non financial stakeholders such as employees. In order to get employee commitment firms maintain substantial financial resources. This results in employees' belief about firm's commitment towards their welfare. In case of failure of firm's commitment for employee welfare by not providing them benefits and opportunities for their self development and career growth will result in employee dissatisfaction. This will cause employee turnover which will not only lead to a decreased firm value but also a negative image of company in market.

According to my prediction, the higher the human capital investment opportunities, as determined by a higher HCIOI score, the higher will be cash holdings' incentives. By using firm and country specific variables, I construct an index to proxy human capital investment opportunities in developing economies. Using a sample of 1838 foreign firms operating BRICS countries for a period of six years from 2010-2015, I find very strong evidence that foreign firms

facing higher human capital investment opportunities hold higher level of cash. This positive relationship is verified by various robustness tests. Moreover the impact of HCI opportunities on cash holdings is stronger for China and India than Brazil, Russia and South Africa and the results confirm that the impact of human capital investment opportunities is stronger for i) foreign firms than domestic firms; ii) high labor-intensive industries than low labor-intensive industries; iii) non-distressed firms than distressed firms; and iv) financially constrained firms than unconstrained firms. Overall, my results are robust and consistent across all specified models which suggest that the human investment opportunity index has a positive and significant impact on cash holdings.

6 FUTURE DIRECTIONS

I believe that two additional analyses may be useful in understanding the relationship between human capital investment opportunities and cash holdings in developing economies. These include role of economic distress risk and corporate governance. As this study only focuses financial distress, so in future the role of economic distress risk can be incorporated. Specially from developing countries' perspective, where earnings may badly be affected by country specific factors such as taxes and inflation that have direct impact on consumer purchasing power and consequently on demand of companies' products. Even though foreign firms are having well diversified operations but such factors may affect their overall performance.

Second, I believe role of corporate governance on relationship between human capital investment opportunities and cash holdings might be useful. As past studies demonstrate that entrenched mangers like to hold more cash for their personal benefits and managers also opt

empire building. So it is interesting to investigate that how do managers respond to the choice between investment opportunities in human assets and capital assets? Considering the impact of two choices as capital assets will result in increase in size of firm as asset base of firm is increased which gives immediate benefits to managers compared to investment in human capital where the return is expected in long term and on the other hand there is high risk of human capital. As in case of employee turnover, company will lose 100% investment on employee development.

Above questions provide an opportunity to investigate the role of economic distress and corporate governance of foreign firms in developing economies from human capital investment opportunities.

Table 1: List of Variables

Variable	Symbol	Definition
Human Capital Investment Index (HCIOI)		
Education Index	**EI**	Measured as Education index provided by UNDP for each country in given year.
Employee Cost	**EC**	Measured as logarithm of total costs associated with employees to number of employees.
Employee Efficiency	**EE**	Measured as logarithm of total sales to number of employees.
Employee Stock Options	**ESO**	Measured as logarithm of total employee stock options to number of employees.
Dependent Variable		
Cash Holding	**Cash**	Measured as cash and cash equivalents to sales ratio
Control Variables		
Size	**FSIZE**	measured as logarithm of total assets
Financial leverage	**FLEV**	measured as total debt to asset ratio
Cash Flow	**CF**	measured as cash flow to total assets
Cash Flow Volatility	**VCF**	measured as deviation of firm's cash flow to asset ratio for the past five years
Working Capital	**NWC**	measured as net working capital minus cash scaled by total assets
Research & Development	**R&D**	measured as R&D expenditure to sales ratio
Capital Expenditure	**CAPEX**	measured as capital expenditure to total assets
Market to Book value of Equity	**MBR**	measured as market value of equity divided by book value of equity
Dividend Policy	**DP**	measured as a dummy variable, which takes a value of one if firm pays dividend to common stockholders and zero otherwise.

Table 2: Sample

	Brazil	China	India	Russia	South Africa	Total
Automobile	22	47	29	24	26	148
Chemical & Fertilizer	19	43	26	23	24	135
Construction	25	71	33	30	31	190
Equipment	15	55	21	19	20	130
Food & Beverages	33	43	44	39	42	201
Metal & Mining	19	39	26	23	24	131
Oil & Gas	17	46	24	20	21	128
Other Manufacturing	30	72	43	40	40	225
Other Services	27	35	37	34	36	169
Pharmaceutical	21	61	28	25	27	162
Telecommunication	32	69	42	36	40	219
	260	**581**	**353**	**313**	**331**	**1838**

Table 3- Summary Statistics of Dependent and Independent Variables

Table 3 contains Panel A, B, C, D and E, where Panel A reports country wise summary statistics of cash holdings. Panel B reports the averages of each component of human capital opportunities index. Panel C reports the summary statistics of HCIOI. Panel D reports summary statistics of all the variables for overall sample. Panel E shows correlation matrix. Panel D reports the mean, median, minimum, maximum and standard deviation of cash holdings and control variables. Here cash holdings is expressed as cash and marketable securities to asset ratio whereas other variables include i) *size of firm*; measured as logarithm of total assets, ii) *financial leverage*; measured as total debt to total asset ratio, iii) *working capital*; measured as current assets excluding cash, marketable securities and current liabilities to total assets, *iv) cash flow*; measured as cash flow to total assets, v) *cash flow volatility*; measured as deviation of firm's cash flow to asset ratio from its past five years' average, vi) *research and development*; measured as R&D expenditure to sales ratio, vii) *capital expenditure*; measured as long term investments to total assets, viii) *dividend policy*; measured as a dummy variable, which takes a value of one if firm pays dividend to common stockholders and zero otherwise. ***, **, and * represents the significance level at 1%, 5% and 10%.

Panel A: Country wise Cash Holdings

Country	Observations	Mean	Std. Dev	Median
Brazil	1560	0.0917	0.108	0.053
China	3486	0.144	0.132	0.141
India	2118	0.118	0.140	0.061
Russia	1878	0.107	0.138	0.055
South Africa	1986	0.102	0.099	0.072
Overall	11028	0.113	0.130	0.090

Panel B: Components of Human Capital

	Brazil	China	India	SA	Russia	Overall
Employee Costs						
Cost per employee	45	46	49	44	38	44
ESOs per Employee	42	43	61	52	39	47
Cost of employees to sales	0.21	0.22	0.25	0.19	0.23	0.22
Efficiency						
Sales per employee	288.41	255.61	320.69	226.63	396.00	297.86
Profit per employee	25.84	24.16	16.39	24.33	17.28	21.76
Cash Flows per employee	34.38	23.49	37.34	32.11	39.51	31.97
Employee Cost Turnover	10.26	6.84	7.73	7.01	9.03	7.90
Education Index	0.660	0.606	0.461	0.687	0.782	0.630
Observations	1560	3486	2118	1986	1878	11028

Panel C: Human Capital Investment Opportunities Index

	Brazil	China	India	SA	Russia	Overall
Mean	0.11	0.19	0.17	0.16	0.15	**0.156**
Maximum	4.72	8.29	8.52	7.73	6.17	8.52
Minimum	-5.76	-10.44	-6.17	-6.38	-5.16	-10.44
Std. Dev.	1.65	1.60	1.64	1.58	1.64	1.62
Observations	1560	3486	2118	1986	1878	11028

Panel D: Summary Statistics of Overall Sample

Variables	Observations	Mean	Std. Dev	Median
Cash	11028	0.128	0.130	0.090
Firm Size	11028	5.655	1.118	5.751
Leverage	11028	0.157	0.177	0.101
Cash Flows	11028	0.095	0.266	0.076
Cash Flows Volatility	11028	0.072	0.134	0.092
Net Working Capital	11028	0.143	0.168	0.114
Capital Expenditure	11028	0.223	0.151	0.217
Dividend Policy	11028	0.751	0.198	1.000
R&D	11028	0.004	0.015	0.002

Panel E -Correlation Matrix

	Cash	HCIOI	Firm Size	Leverage	Cash Flows	Cash Flows Volatility	Net Working Capital	Capital Expenditure	Dividend Policy	R&D
Cash	1									
HCIOI	0.049***	1								
	(0.000)									
Firm Size	-0.01***	0.05*	1							
	(0.000)	(0.083)								
Leverage	-0.007***	-0.06**	0.078***	1						
	(0.000)	(0.012)	(0.000)							
Cash Flows	-0.008**	0.12***	0.009**	0.002***	1					
	(0.023)	(0.000)	(0.036)	(0.000)						
Cash Flows Volatility	0.02***	0.03***	0.02***	0.04***	-0.19***	1				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
Net Working Capital	-0.11**	-0.039***	-0.08	-0.09***	0.01	-0.01***	1			
	(0.19)	(0.000)	(0.291)	(0.000)	(0.221)	(0.000)				
Capital Expenditure	-0.01***	-0.19**	0.12***	0.125***	0.008	0.12***	-0.16***	1		
	(0.000)	(0.034)	(0.000)	(0.000)	(0.351)	(0.000)	(0.000)			
Dividend Policy	-0.12**	-0.018***	0.10***	0.036**	0.12***	-0.002***	0.032**	-0.11***	1	
	(0.027)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.034)	(0.000)		
R&D	0.03***	0.026***	0.09***	-0.02***	-0.04***	0.002*	-0.002	-0.07***	-0.062***	1
	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.067)	(0.325)	(0.000)	(0.000)	

Table 4: Summary Statistics Based on Positive and Negative Score

Table 4 reports the summary statistics of sample based on positive and negative values of HCIOI score. Positive score shows more HCI opportunities and negative score means lower HCI opportunities. (P-N) represents the mean differences between positive and negative scores for each variable. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variable	Overall N=11028	Positive HCIOI (P) N=5351	Negative HCIOI (N) N=5668	Mean Difference (P-N)
Dependent Variable				
Cash	0.128	0.133	0.124	0.009***
Control Variables				
Firm Size	5.655	6.117	5.166	0.951***
Leverage	0.275	0.167	0.149	0.018***
Cash Flows	0.095	0.099	0.092	0.007***
Cash Flows Volatility	0.072	0.019	0.126	-0.106**
Net Working Capital	0.143	0.134	0.153	-0.020***
Capital Expenditure	0.223	5.738	4.822	0.916**
Dividend Policy	0.755	0.781	0.729	0.052
R&D	0.004	0.005	0.003	0.001*

Table 5: Human Capital Investment Opportunities and Cash Holdings- Country wise Analysis

Table 5 reports the results of main models to test the impact of human capital investment opportunities on cash holdings for each country. These results include pooled OLS and fixed effects models. Models (1), (3), (5), (7), and (9) represent the findings of pooled OLS for Brazil, China, India, Russia and South Africa respectively. Models (2), (4), (6), (8), and (10) represent the findings of fixed effects modelfor Brazil, China, India, Russia and South Africa respectively. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Brazil		China		India		Russia		South Africa	
	Pooled	Fixed	Pooled	Fixed	Pooled	Fixed	Pooled	Fixed	Pooled	Fixed
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
HCIOI	0.201***	0.213***	0.303***	0.326***	0.269***	0.286***	0.241***	0.262***	0.211***	0.223***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firm Size	1.109***	0.176***	1.109**	0.154***	0.264***	0.416 ***	0.403***	0.395***	1.649***	2.223***
	(0.000)	(0.000)	(0.028)	(0.000)	(0.006)	(0.008)	(0.004)	(0.000)	(0.000)	(0.000)
Leverage	-0.726***	-1.081***	0.889**	1.081***	-2.078***	0.887	-0.045***	-0.184***	-1.541***	-1.48***
	(0.000)	(0.000)	(0.017)	(0.000)	(0.000)	(0.234)	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-3.281***	-0.654***	-2.183***	-0.511***	-5.340***	-6.14***	-0.48***	-0.054*	-3.615***	-1.25***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.062)	(0.000)	(0.000)
Cash Flows Volatility	1.620**	1.237***	1.790**	1.191***	0.265***	0.240***	0.108***	0.460**	1.620**	1.240**
	(0.026)	(0.036)	(0.036)	(0.036)	(0.000)	(0.000)	(0.000)	(0.046)	(0.016)	(0.037)
Net Working Capital	-1.935**	-2.431**	-1.865*	-2.515**	0.454***	0.014**	-0.531***	-0.431**	-1.515**	-1.456**
	(0.040)	(0.032)	(0.078)	(0.032)	(0.000)	(0.041)	(0.000)	(0.022)	(0.040)	(0.032)
Capital Expenditure	-0.854**	-0.783*	-1.124**	0.6818*	-1.981***	-3.498***	-0.303***	-0.328***	-3.854**	-2.18***
	(0.012)	(0.067)	(0.012)	(0.012)	(0.000)	(0.000)	(0.000)	(0.067)	(0.011)	(0.007)
Dividend Policy	-0.202	-0.348***	-0.102	-0.445***	-0.1508	-0.193*	-0.159	-0.273***	-1.102***	-1.34***
	(0.101)	(0.007)	(0.101)	(0.007)	(0.507)	(0.091)	(0.101)	(0.007)	(0.000)	(0.001)
R&D	-2. 129	-1.281	-4.569	-1.189**	1.598	5.324	-1. 93***	-0.891	0. 091*	0.864**
	(0.230)	(0.290)	(0.230)	(0.030)	(0.937)	(0.506)	(0.000)	(0.190)	(0.081)	(0.031)
Intercept	0.160	0.211*	0.337	2.852**	0.0457*	-1.045	-0.124	0.093	-2.160	-1.211
	(0.339)	(0.074)	(0.555)	(0.025)	(0.090)	(0.223)	(0.339)	(0.531)	(0.252)	(0.228)
Year dummies	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Industry dummies	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Observations	1560	1560	3486	3486	2118	2118	1878	1878	1986	1986
Adjusted R-squared	0.51	0.56	0.39	0.58	0.32	0.44	0.28	0.51	0.27	0.42

Table 6- Human Capital Investment Opportunities and Cash Holdings

Table 6 reports the results of main models to test the impact of human capital investment opportunities on cash holdings. These results include pooled regression, fixed effects model, cross sectional and Fama-Macbeth regression. Models (1), (2), and (3) represent the findings of pooled OLS and model 5 and 6 represent fixed effect models. Model 1 and 4 shows the results regressions using control variables only. Model 2 shows results of pooled regression using HCIOI and other control variables. Model 3 is same like model 2 but it incorporates country dummies. Model 5 shows the results of fixed effect model. Model 6 and 7 control the effects across firm and industry. Model 8 reports the findings of Fama-Macbeth regression. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS			Fixed Effect		Across Firm	Across industry	Fama MacBeth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HCIOI		1.23***	1.21***		1.29***	1.31***	1.22***	1.23***
		(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)
Firm Size	-0.47***	-1.76***	-1.72***	-1.10***	-2.16***	-1.09***	-2.06***	-2.21***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-1.24***	-0.95***	-1.02***	-2.20***	-2.45***	-1.22***	-1.39***	-2.181***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-5.52***	-4.62***	-4.65***	-3.28***	-3.62***	-3.19***	-3.13***	-2.91***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	0.220**	0.190***	0.188***	1.620***	1.112***	1.298***	1.912***	0.876***
	(0.026)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Net Working Capital	-3.293*	-3.257*	-3.312**	-1.935**	-2.35***	-1.394**	-2.017	-2.011*
	(0.090)	(0.095)	(0.032)	(0.021)	(0.000)	(0.015)	(0.015)	(0.061)
Capital Expenditure	-0.92***	-1.17**	-0.96**	-0.865**	-2.70**	-0.62**	-1.23**	-1.70***
	(0.000)	(0.026)	(0.031)	(0.012)	(0.036)	(0.023)	(0.012)	(0.000)
Dividend Policy	-0.23***	-0.61***	-0.72***	-0.20***	-2.118**	-0.881**	-1.016***	-0.718**
	(0.001)	(0.001)	(0.000)	(0.001)	(0.031)	(0.031)	(0.001)	(0.041)
R&D	1.5129	2.812	2.623	2. 129	1.812	1.233**	1.192	0.287
	(0.220)	(0.280)	(0.180)	(0.230)	(0.310)	(0.019)	(0.220)	(0.113)
Intercept	0.160	0.180	0.120	-1.13	-1.210	-0.010	-1.342	-0.128
	(0.339)	(0.311)	(0.132)	(0.858)	(0.124)	(0.165)	(0.291)	(0.424)
Year dummies	Yes	Yes	Yes	No	No	No	No	No
Country dummies	No	No	Yes	No	No	No	No	No
No of Observations	11028	11028	11028	11028	11028	1838	584	5058
Adjusted R^2	0.26	0.33	0.46	0.47	0.52	0.44	0.49	0.39

Table 7: Role of Competition on Relation between Cash Holdings and HCIOI

Table 7 reports the findings of pooled regressions and fixed effects models for domestic and foreign firms. I take sample of 2103 domestic firms from same 5 different countries where sample for foreign countries is taken. All variables are same as in earlier models. Model 1 and 3 reports the results of foreign firms and model 2 and 4 reports results for domestic firms. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effect	
	Foreign	Domestic	Foreign	Domestic
	(1)	(2)	(3)	(4)
HCIOI	1.23***	0.279***	1.29***	0.263***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm Size	-1.768***	2.264***	-2.162***	-2.123***
	(0.000)	(0.001)	(0.000)	(0.000)
Leverage	-0.95***	-2.078***	-2.45***	-1.49***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-4.62***	-5.340***	-3.62***	-1.29***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	0.190***	0.212***	1.112***	1.240**
	(0.000)	(0.000)	(0.000)	(0.037)
Net Working Capital	-3.257*	-1.464***	-2.357	-1.366**
	(0.095)	(0.000)	(0.015)	(0.032)
Capital Expenditure	-1.17**	-1.981***	-2.70**	-2.18***
	(0.026)	(0.000)	(0.012)	(0.007)
Dividend Policy	-0.618***	-0.1508	-2.118**	-1.34***
	(0.001)	(0.217)	(0.031)	(0.001)
R&D	2.812	1.598***	1.812	1.864**
	(0.280)	(0.000)	(0.310)	(0.031)
Intercept	0.180	-0.0457	-1.210	-1.011
	(0.311)	(0.190)	(0.114)	(0.238)
Year dummies	Yes	Yes	No	No
No of observations	11028	12618	11028	12618
Adjusted R-squared	0.28	0.34	0.45	0.51
p-value (F-statistics) equal coefficients on HCIOI	0.03		0.02	

Table 8: Role of Industry on Relation between Cash Holdings and HCIOI

Table 8 reports the findings of pooled regression and fixed effects models for domestic and foreign firms. I categorize the foreign firms on the basis of labor intensive, Following Ertugrul (2013), firms from high-tech, communications, mining, hotel are considered as labor intensive. All variables are same as in earlier models. Model 1 and 3 reports the results of labor-intensive firms and model 2 and 4 reports results for capital-intensive firms. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effect	
	Labor-Intensive	Capital-Intensive	Labor-Intensive	Capital-Intensive
	(1)	(2)	(3)	(4)
HCIOI	1.069***	0.341***	1.116***	0.362***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm Size	-0.244***	-0.303***	-0.432 ***	-0.345***
	(0.006)	(0.004)	(0.008)	(0.000)
Leverage	-2.012***	-0.065***	-0.887**	-0.264***
	(0.000)	(0.000)	(0.022)	(0.000)
Cash Flows	-3.240***	-1.58***	-5.16***	-0.084*
	(0.000)	(0.000)	(0.000)	(0.061)
Cash Flows Volatility	0.275***	0.108***	0.240***	0.460**
	(0.000)	(0.000)	(0.000)	(0.046)
Net Working Capital	-0.554***	-0.531***	-0.024**	-0.331**
	(0.000)	(0.000)	(0.031)	(0.022)
Capital Expenditure	-1.481***	-0.303***	-2.568***	-0.478***
	(0.000)	(0.000)	(0.000)	(0.001)
Dividend Policy	0.1608	-0.149	0.153*	0.233***
	(0.507)	(0.101)	(0.081)	(0.007)
R&D	1.599	-1. 93***	6.324	-0.991**
	(0.127)	(0.000)	(0.406)	(0.041)
Intercept	0.0457*	-0.124	-1.045	0.023
	(0.090)	(0.339)	(0.223)	(0.531)
Year dummies	Yes	Yes	No	No
No of Observations	4416	6612	4416	6612
Adjusted R-squared	0.37	0.42	0.53	0.51
p-value (F-statistics) of equal coefficients on HCIOI	0.04		0.02	

Table 9: Role of Financial Distress on Relation between Cash Holdings and HCIOI

Table 9 reports the findings of pooled regressions and fixed effects models for distressed and non distressed firms. Here I first categorize the foreign firms into distressed and non distressed firms by using Altman z score. Z score is calculated as "1.2 (Working Capital / Total Assets) + 1.40 (Retained Earnings / Total Assets) + 3.30 (Earnings Before Interest and Taxes / Total Assets) + 0.60 (Market Value of Equity / Book Value of Total Liabilities) + 1.0 (Sales / Total Assets)". A score of more than 3 suggests a strong position of firm where as a score of less than 1.8 suggests a distressed position. Based on this I categorize financial distressed firms with z score 1.8 or below and rest were categorized as non-distressed firms. Model 1 and 3 reports the results of non-distressed firms, and model 2 and 4 reports results for distressed firms. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effect	
	Non-distressed	Distressed	Non-distressed	Distressed
	(1)	(2)	(3)	(4)
HCIOI	0.613***	0.401	0.628***	0.213
	(0.000)	(0.213)	(0.000)	(0.121)
Firm Size	-1.649***	-1.129***	-2.243***	-0.176***
	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-1.441***	-0.736***	-1.21***	-1.081***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-3.615***	-3.221***	-1.51***	-0.654***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	1.520**	1.720**	1.260**	1.137***
	(0.016)	(0.026)	(0.027)	(0.036)
Net Working Capital	-1.465**	-1.935**	-1.466**	-2.431**
	(0.031)	(0.040)	(0.022)	(0.032)
Capital Expenditure	-3.954**	-0.754**	-0.18***	-0.783*
	(0.021)	(0.012)	(0.001)	(0.067)
Dividend Policy	-1.201***	-0.102	-1.44***	-0.348***
	(0.000)	(0.113)	(0.001)	(0.007)
R&D	0. 081*	3. 129	0.364**	1.281
	(0.071)	(0.330)	(0.031)	(0.290)
Intercept	-1.160	0.170	-1.111	0.311
	(0.258)	(0.339)	(0.328)	(0.444)
Year dummies	Yes	Yes	No	No
Observations	7878	3150	7878	3150
Adjusted R-squared	0.42	0.36	0.56	0.51
p-value (F-statistics) equal coefficients on HCIOI	0.02		0.03	

Table 10: Role of Financial Constraints on Relation between Cash Holdings and HCIOI

Table 10 reports the findings of pooled regressions and fixed effects models for financially constrained and unconstrained firms. Here I first categorize the foreign non-distressed firms into constrained and unconstrained firms by using WW index proposed by Whited and Wu (2006). WW index is calculated as "− 0.0910 (Cash Flow) − 0.0620 (Dividend Dummy) + 0.0210 (Long Term Debt − 0.044 (Firm Size) + 0.102 (Industry Sales Growth) − 0.035 (Firm Sales Growth)". Firms with WW index score of above (below) median are categorized as constrained (unconstrained). Model 1 and 3 reports the results of constrained firms and model 2 and 4 reports results for unconstrained firms. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effect	
	Constrained	Un-constrained	Constrained	Un-constrained
	(1)	(2)	(3)	(4)
HCIOI	0.881***	0.329*	0.921***	0.337*
	(0.000)	(0.092)	(0.000)	(0.084)
Firm Size	-1.562***	-2.264***	-2.162***	-2.123***
	(0.000)	(0.001)	(0.000)	(0.000)
Leverage	-1.125***	-2.078***	-1.45***	-1.57***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-1.62***	-2.130***	-3.12***	-1.29***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	0.290***	0.112***	0.112***	0.640**
	(0.000)	(0.000)	(0.000)	(0.021)
Net Working Capital	-2.357*	-1.663***	-2.661**	-1.716**
	(0.095)	(0.000)	(0.016)	(0.032)
Capital Expenditure	-1.53**	-1.211***	-1.72**	-2.18***
	(0.031)	(0.000)	(0.013)	(0.001)
Dividend Policy	-0.418***	-0.151*	-1.128**	-1.13***
	(0.001)	(0.056)	(0.031)	(0.003)
R&D	1.312	1.158***	1.272	1.124**
	(0.260)	(0.000)	(0.210)	(0.022)
Intercept	0.110	-0.0317	-0.210	-0.021
	(0.212)	(0.290)	(0.124)	(0.338)
Year dummies	Yes	Yes	No	No
No of Observations	3666	4212	3666	4212
Adjusted R-squared	0.21	0.28	0.39	0.42
p-value (F-statistics) equal coefficients on HCIOI	0.02		0.04	

Table 11: Cash Holdings and HCIOI: Instrumental Regression Analysis

Table 11 reports the findings of two stage least squares model. Here Model 1 represents the results of first instrumental variable for HCIOI, where I use employee cost turnover ratio (defined as sales / cost of employees) as instrumental variable. Model two represents the results of regression where I use industry average cost of employee as instrumental variable. Model 3 reports the results of 2SLS, where I use country dummies as instrumental variables and model 4 reports results of 2SLS where I use all three instrumental variables together. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Model (1)		Model (2)		Model (3)		Model (4)	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
	(HCIOI)	(Cash)	(HCIOI)	(Cash)	(HCIOI)	(Cash)	(HCIOI)	(Cash)
HCIOI		1.43***		1.38***		1.36***		1.41***
		(0.000)		(0.000)		(0.000)		(0.000)
Firm Size	-1.021***	-1.211***	-1.131***	-1.063***	-1.214***	-1.462***	-1.156***	-1.798***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Leverage	-0.235***	-0.66***	-0.201***	-1.81***	0.046	-1.09***	-0.125***	-0.85***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.121)	(0.000)	(0.000)	(0.000)
Cash Flows	-4.724***	-3.12***	-3.614***	-3.02***	-0. 25**	-3.69***	-2.714***	-4.02***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.013)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	0.029***	0.120***	0.031***	0.173***	0.010**	0.146***	0.039***	0.145***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.031)	(0.000)	(0.000)	(0.000)
Net Working Capital	0.017	-2.157*	0.124	-3.257***	0.131*	-2.055**	0.019	-3.287*
	(0.803)	(0.095)	(0.402)	(0.000)	(0.067)	(0.038)	(0.303)	(0.095)
Capital Expenditure	0.185***	-1.27**	0.136***	-1.08**	0.251***	-0.15**	0.185***	-1.18**
	(0.000)	(0.036)	(0.000)	(0.026)	(0.000)	(0.022)	(0.000)	(0.026)
Dividend Policy	-0.313***	-0.118***	-0.213***	-0.511***	0.071	-0.318***	-0.218***	-0.618***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.256)	(0.000)	(0.000)	(0.001)
R&D	3.232***	1.212	3.534***	2.212	0.698***	1.312	2.531***	2.802
	(0.000)	(0.110)	(0.000)	(0.280)	(0.000)	(0.160)	(0.000)	(0.280)
Intercept	5.251***	0.020	3.262***	0.132	6.015***	0.129	6.198***	0.080
	(0.000)	(0.151)	(0.000)	(0.211)	(0.000)	(0.431)	(0.000)	(0.329)
Instrumental Variables								
Employee cost turnover	0.110***						0.090***	
	(0.001)						(0.000)	
Industry cost of employees			0.160***				0.151***	
			(0.000)				(0.000)	
Country dummies								
Brazil					0.91***		0.90***	
India					0.56***		0.61***	
Russia					0.98***		0.99***	
South Africa					0.78***		0.79***	
No. of Observations	11028	11028	11028	11028	11028	11028	11028	11028
Adjusted R-squared	0.34	0.52	0.36	0.54	0.38	0.51	0.41	0.57
F-Statistics	44.4		51.1		19.3		22.7	
P-value (J-statistics)							0.22	

Table 12: Cash Holdings and Firm Specific HCIOI

Table 12 reports the findings of pooled regressions and fixed effects model using firm specific human capital investment opportunities index. Model 1 and 3 represents the results of first index where only three firm specific variables (employee cost, employee efficiency and employee stock options) are taken as human capital investment opportunities. Model 2 and 4 shows the results of other index where only cost of employees and employee efficiency are considered as human capital investment opportunities. An additional variable "education index" is added in this regression as control variable. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effects	
	(1)	(2)	(3)	(4)
$HCIOI_1$	0.877***		0.892***	
	(0.000)		(0.001)	
$HCIOI_2$		0.611***		0.635***
		(0.000)		(0.000)
Education Index	-2.363***	-2.176***	-2.512***	-1.981***
	(0.000)	(0.000)	(0.000)	(0.000)
Firm Size	-1.209**	-1.009***	-0.254***	-0.326***
	(0.028)	(0.000)	(0.000)	(0.000)
Leverage	-0.189**	-0.526***	-1.021***	-1.011***
	(0.017)	(0.000)	(0.000)	(0.000)
Cash Flows	-2.323***	-3.181***	-0.421***	-0.754***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	1.810**	1.520**	1.231**	1.927***
	(0.012)	(0.028)	(0.011)	(0.000)
Net Working Capital	-1.215*	-1.625**	-1.765**	-1.031***
	(0.078)	(0.021)	(0.032)	(0.002)
Capital Expenditure	-1.124**	-0.864**	-0.518*	-0.543*
	(0.011)	(0.012)	(0.029)	(0.057)
Dividend Policy	-0.302	-0.102	-0.445***	-0.348***
	(0.213)	(0.111)	(0.001)	(0.007)
R&D	1.269	1. 129	1.119	1.081
	(0.230)	(0.230)	(0.120)	(0.290)
Intercept	0.317	0.160	0.852	0.021
	(0.375)	(0.239)	(0.125)	(0.274)
Year dummies	Yes	Yes	No	No
Observations	11028	11028	11028	11028
Adjusted R-squared	0.33	0.28	0.47	0.43

Table 13: Alternative Measures of Human Capital Investment Opportunities

Table 13 reports the findings of pooled regressions and fixed effects model using alternative measure of human capital investment opportunities index. Model 1 and 3 represents the results of first variable where I use market to book ratio as growth opportunities as alternative measure of human capital investment opportunities. Model 2 and 4 shows the results where I use employee cost to efficiency ratio as human capital investment opportunities. Values in parentheses show p-values which are corrected for standard errors using whites' robust standard errors. ***, **, and * represents the significance level at 1%, 5% and 10%.

Variables	Pooled OLS		Fixed Effects	
	(1)	(2)	(3)	(4)
Market to Book Ratio	3.239***		3.096***	
	(0.000)		(0.000)	
Employee Cost to Efficiency Ratio		0.719***		0.796***
		(0.000)		(0.000)
Firm Size	-1.672***	-1.064***	-1.162***	-1.023***
	(0.000)	(0.001)	(0.000)	(0.000)
Leverage	-1.23***	-1.318***	-2.45***	-1.79***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows	-2.12***	-3.140***	-2.62***	-1.39***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash Flows Volatility	0.290***	0.012***	1.012***	1.410**
	(0.000)	(0.000)	(0.000)	(0.037)
Net Working Capital	-4.257*	-1.464***	-2.357**	-1.306***
	(0.095)	(0.000)	(0.021)	(0.000)
Capital Expenditure	-2.27***	-1.081***	-2.77**	-2.08***
	(0.000)	(0.000)	(0.012)	(0.000)
Dividend Policy	-1.618***	-0.1508**	-2.118**	-1.21***
	(0.000)	(0.062)	(0.022)	(0.000)
R&D	1.202	1.296***	1.902	1.604**
	(0.121)	(0.000)	(0.210)	(0.042)
Intercept	-0.080	-0.0377	-1.010	-1.018
	(0.317)	(0.251)	(0.144)	(0.208)
Year dummies	Yes	Yes	No	No
Observations	11028	12096	11028	12096
Adjusted R-squared	0.23	0.31	0.46	0.53

Appendix: Figures

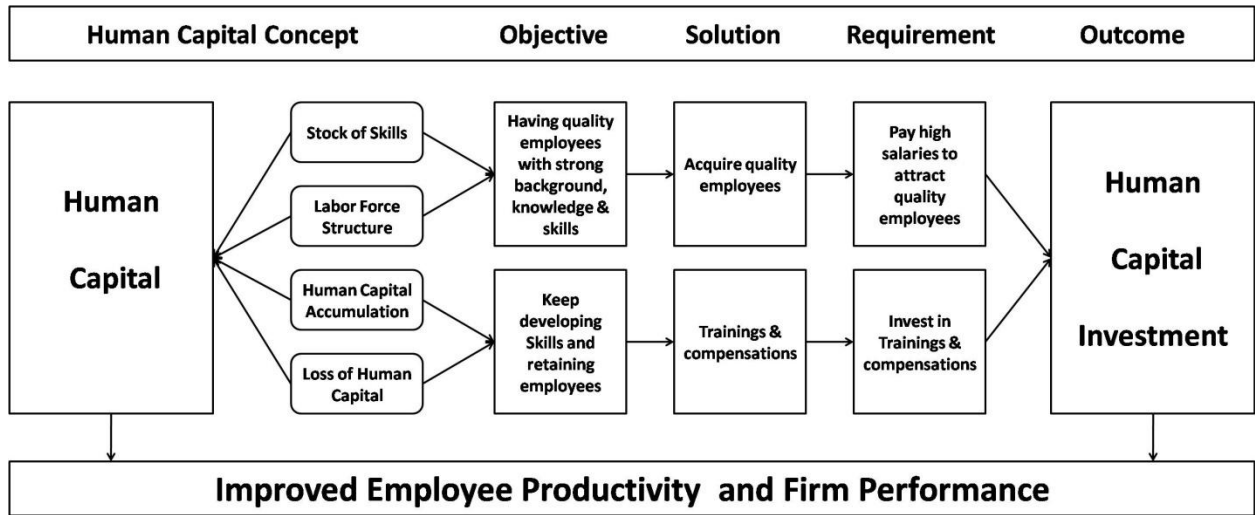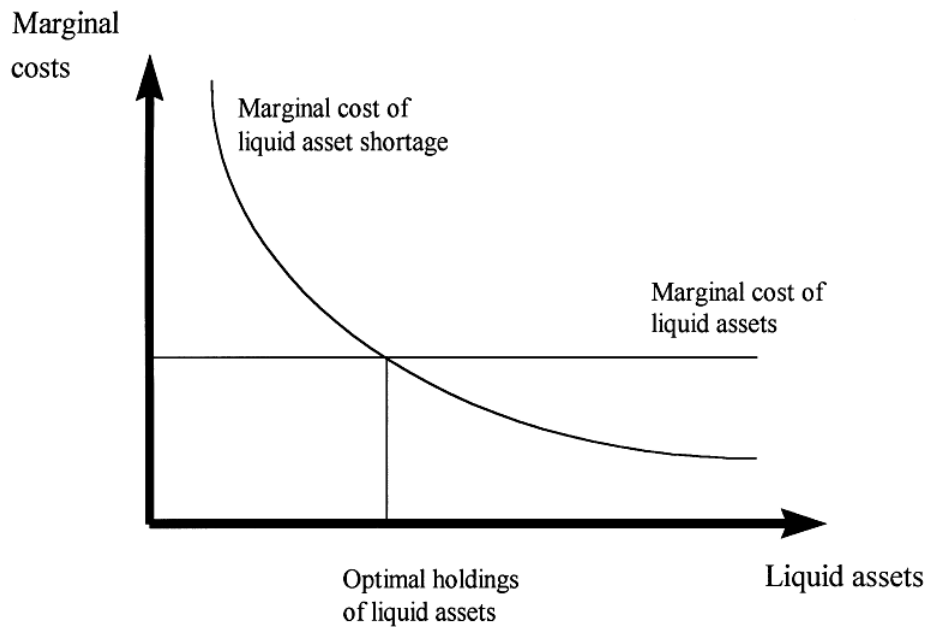## Figure 1: Human Capital Theoretical Framework

Figure 2: Transaction Cost Model of Cash Holdings

Source: *Opler et al. (1999)*
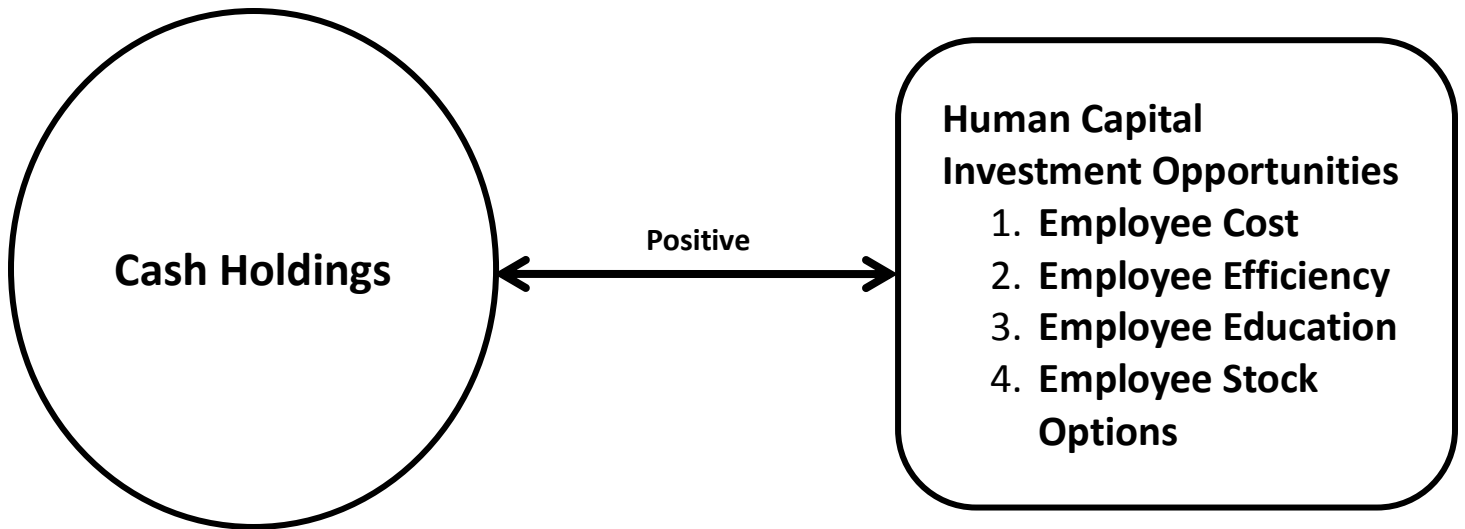
Figure 3: Human Capital and Cash Holdings

Figure 4: Human Capital Opportunities

Variable	Employee Efficiency	Employee Cost	Employee Stock Options	Education Index
Proxy	Sales/Employee	Cost/Employee	ESOs/Employee	EI
Value	High	High	High	High
Investment opportunities	**Lower**	**Lower**	**Lower**	**Lower**

Variable	Employee Efficiency	Employee Cost	Employee Stock Options	Education Index
Proxy	Sales/Employee	Cost/Employee	ESOs/Employee	EI
Value	Lower	Lower	Lower	Lower
Investment opportunities	Higher	Higher	Higher	Higher

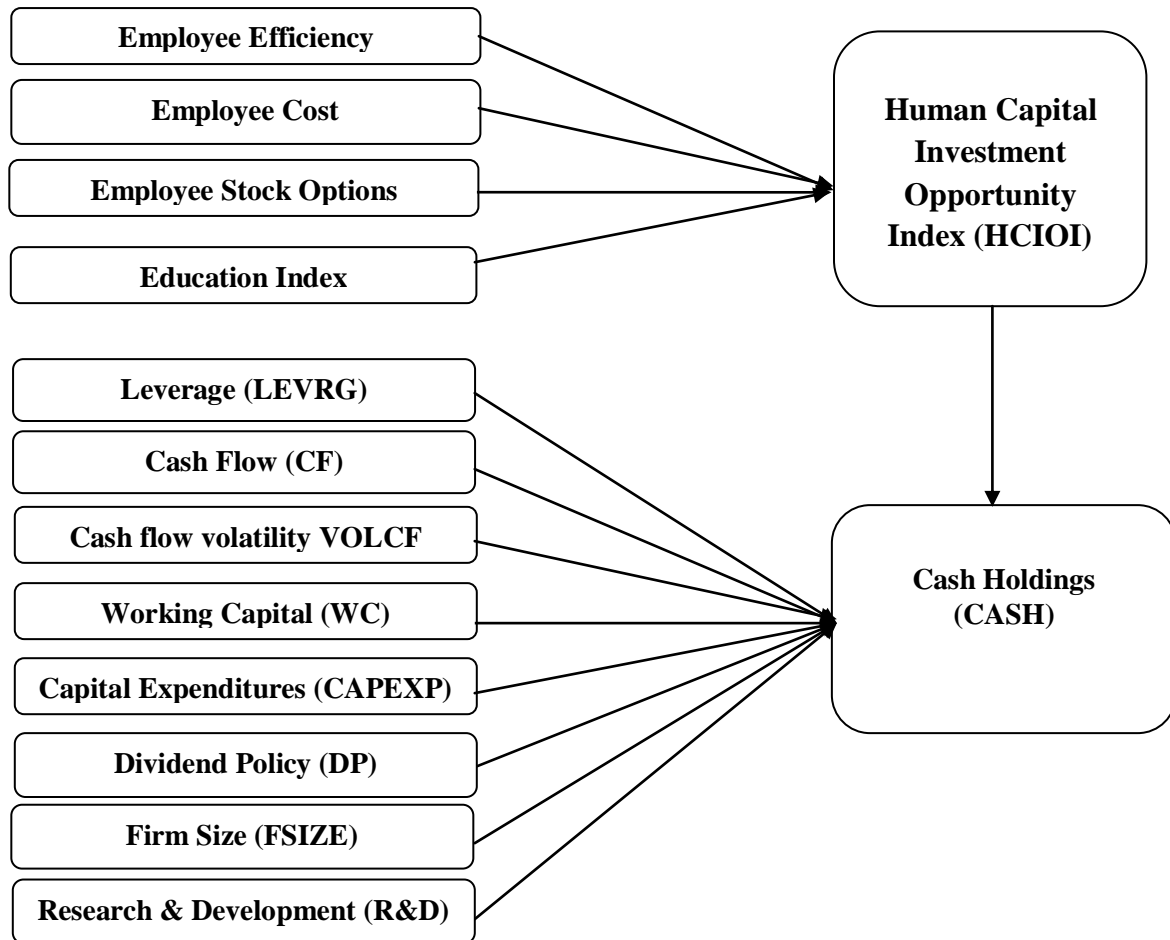| Variable	Employee Efficiency	Employee Cost	Employee Stock Options	Education Index
Proxy	1/(Sales/Employee)	1/(Cost/Employee)	1/(ESOs/Employee)	1/(EI)
Value	Higher	Higher	Higher	Higher
Investment opportunities	Higher	Higher	Higher	Higher

Figure 5: Theoretical Model
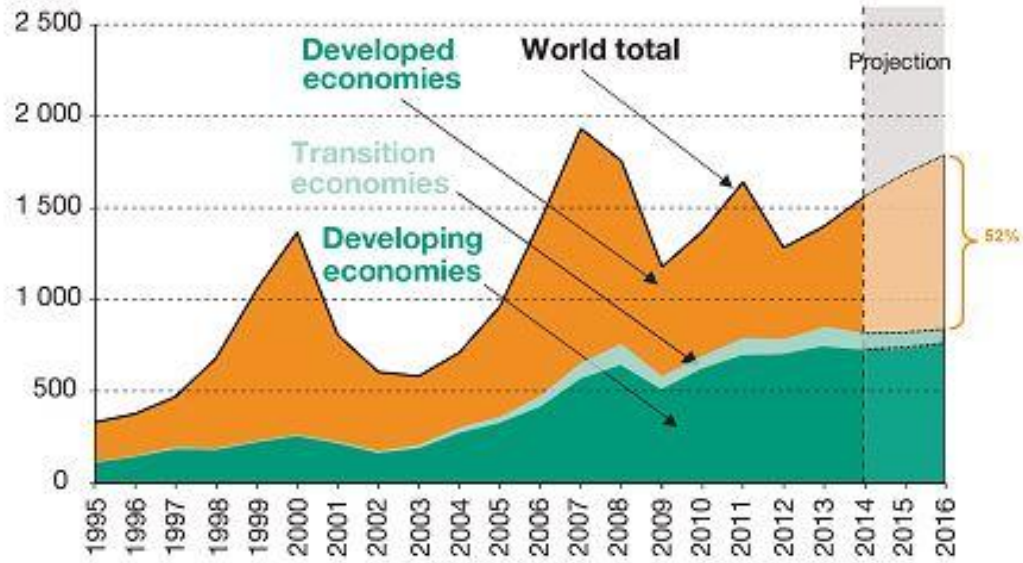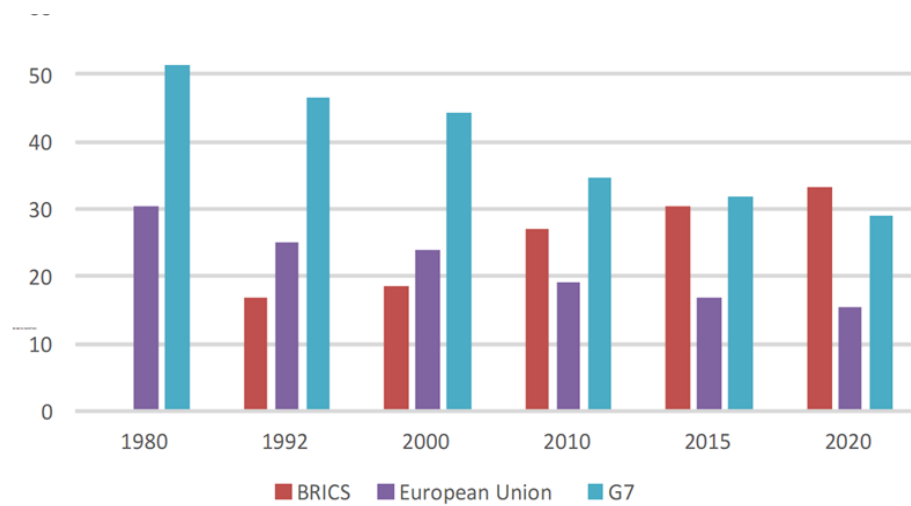
Figure 6: FDI Inflows

Figure 7: Share of BRICS in Global GDP

Source: World Economic Outlook Database, April 2016, IMF
Note: Data for BRICS are available from 1992 onwards
Data for Year 2020 represents the IMF projections.

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References:

Acharya, V., Davydenko, S. A. and Strebulaev, I. A. (2012) 'Cash holdings and credit risk', *Review of Financial Studies*, 25(12), pp. 3572-3609.

Al-Najjar, B. (2013) 'The financial determinants of corporate cash holdings: Evidence from some emerging markets', *International Business Review*, 22(1), pp. 77-88.

Alam, S. M. T. (2015) 'Factors affecting job satisfaction, motivation and turnover rate of medical promotion officer (MPO) in pharmaceutical industry: a study based in Khulna city', *Asian Business Review*, 1(2), pp. 126-131.

Almeida, H., Campello, M. and Weisbach, M. S. (2004) 'The cash flow sensitivity of cash', *The Journal of Finance*, 59(4), pp. 1777-1804.

Almeida, H., Campello, M. and Weisbach, M. S. (2011) 'Corporate financial and investment policies when future financing is not frictionless', *Journal of Corporate Finance*, 17(3), pp. 675-693.

Almeida, R. (2007) 'The labor market effects of foreign owned firms', *Journal of international Economics*, 72(1), pp. 75-96.

Altman, E. I. and Hotchkiss, E. (2010) *Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt*. John Wiley & Sons.

Asiedu, E. (2002) 'On the determinants of foreign direct investment to developing countries: is Africa different?', *World development*, 30(1), pp. 107-119.

Babenko, I., Lemmon, M. and Tserlukevich, Y. (2011) 'Employee stock options and investment', *The Journal of Finance*, 66(3), pp. 981-1009.

Bates, T. W., Kahle, K. M. and Stulz, R. M. (2009) 'Why do US firms hold so much more cash than they used to?', *The Journal of Finance*, 64(5), pp. 1985-2021.

Becker, G. S. (1962) 'Investment in human capital: A theoretical analysis', *The journal of political economy*, pp. 9-49.

Bellack, A. S., Mueser, K. T., Gingerich, S. and Agresta, J. (2013) *Social skills training for schizophrenia: A step-by-step guide*. Guilford Publications.

Belorgey, N., Lecat, R. and Maury, T.-P. (2006) 'Determinants of productivity per employee: An empirical estimation using panel data', *Economics Letters*, 91(2), pp. 153-157.

Berman, E., Bound, J. and Griliches, Z. (1994) 'Changes in the demand for skilled labor within US manufacturing: Evidence from the annual survey of manufacturers', *The Quarterly Journal of Economics*, pp. 367-397.

Bernard, A. B. and Jensen, J. B. (2007) 'Firm structure, multinationals, and manufacturing plant deaths', *The Review of Economics and Statistics*, 89(2), pp. 193-204.

Blatter, M., Muehlemann, S., Schenker, S. and Wolter, S. C. (2015) 'Hiring costs for skilled workers and the supply of firm-provided training', *Oxford Economic Papers*, p. gpv050.

Booth, A. L. and Snower, D. J. (1996) *Acquiring skills: Market failures, their symptoms and policy responses*. Cambridge University Press.

Booth, L., Aivazian, V., Demirguc-Kunt, A. and Maksimovic, V. (2001) 'Capital structures in developing countries', *The journal of finance*, 56(1), pp. 87-130.

Booth, L., Ntantamis, C. and Zhou, J. (2015) 'Financial Constraints, R&D Investment, and the Value of Cash Holdings', *Quarterly Journal of Finance*, 5(04), p. 1550011.

Braverman, H. (1974) 'Labor and Monopoly Capital (New York and London', *Monthly Review Press*.

Bresnahan, T. F., Brynjolfsson, E. and Hitt, L. M. (1999) *Information technology, workplace organization and the demand for skilled labor: Firm-level evidence*.

Brown, J. and Matsa, D. A. (2015) 'Boarding a sinking ship? An investigation of job applications to distressed firms', *The Journal of Finance*.

Brynjolfsson, E., Hitt, L. M. and Kim, H. H. (2011) 'Strength in numbers: How does data-driven decisionmaking affect firm performance?', *Available at SSRN 1819486*.

Cahill, M. B. (2005) 'Is the human development index redundant?', *Eastern Economic Journal*, 31(1), pp. 1-5.

Cézard, M. (1979) 'Les qualifications ouvrières en question', *Économie et statistique*, 110(1), pp. 15-36.

Chang, X., Fu, K., Low, A. and Zhang, W. (2015) 'Non-executive employee stock options and corporate innovation', *Journal of Financial Economics*, 115(1), pp. 168-188.

Ciccotello, C. S., Grant, C. T. and Grant, G. H. (2004) 'Impact of employee stock options on cash flow', *Financial Analysts Journal*, 60(2), pp. 39-46.

Conyon, M. J., Girma, S., Thompson, S. and Wright, P. W. (2002) 'The productivity and wage effects of foreign acquisition in the United Kingdom', *The Journal of Industrial Economics*, 50(1), pp. 85-102.

Core, J. E. and Guay, W. R. (2001) 'Stock option plans for non-executive employees', *Journal of financial economics*, 61(2), pp. 253-287.

Cornell, B. and Shapiro, A. C. (1987) 'Corporate stakeholders and corporate finance', *Financial management*, pp. 5-14.

Cuervo-Cazurra, A. and Genc, M. (2008) 'Transforming disadvantages into advantages: developing-country MNEs in the least developed countries', *journal of international Business Studies*, 39(6), pp. 957-979.

Danneels, E. (2015) 'Survey measures of first-and second-order competences', *Strategic Management Journal*.

Datta, D. K., Guthrie, J. P. and Wright, P. M. (2005) 'Human resource management and labor productivity: does industry matter?', *Academy of management Journal*, 48(1), pp. 135-145.
de Castro, B. V., Cheng, Y., Montenegro, J. L. V. and Pelmonte, J. A. (2016) 'The consequences of education mismatch and skill mismatch on employees' work productivity: A Structural Equation Model', *Luz y Saber*, 9(1&2).

Dittmar, A. and Mahrt-Smith, J. (2007) 'Corporate governance and the value of cash holdings', *Journal of financial economics*, 83(3), pp. 599-634.

Edmans, A. (2011) 'Does the stock market fully value intangibles? Employee satisfaction and equity prices', *Journal of Financial Economics*, 101(3), pp. 621-640.

Edmans, A. (2012) 'The link between job satisfaction and firm value, with implications for corporate social responsibility', *The Academy of Management Perspectives*, 26(4), pp. 1-19.

Ertugrul, M. (2013) 'EMPLOYEE-FRIENDLY ACQUIRERS AND ACQUISITION PERFORMANCE', *Journal of Financial Research*, 36(3), pp. 347-370.

Falato, A., Kadyrzhanova, D. and Sim, J. W. (2012) 'A US Corporate Savings Glut? The Role of Intangible Capital'.

Faleye, O. and Trahan, E. A. (2011) 'Labor-friendly corporate practices: Is what is good for employees good for shareholders?', *Journal of Business Ethics*, 101(1), pp. 1-27.

Fang, H., Nofsinger, J. R. and Quan, J. (2015) 'The effects of employee stock option plans on operating performance in Chinese firms', *Journal of Banking & Finance*, 54, pp. 141-159.

Faulkender, M. and Wang, R. (2006) 'Corporate financial policy and the value of cash', *The Journal of Finance*, 61(4), pp. 1957-1990.

Felstead, A., Ashton, D., Burchell, B., Green, F. and Coffield, F. (1999) 'Skill trends in Britain: trajectories over the last decade', *Speaking truth to power: research and policy on lifelong learning*, 3, p. 55.

Florackis, C. and Ozkan, A. (2009) 'The impact of managerial entrenchment on agency costs: An empirical investigation using UK panel data', *European Financial Management*, 15(3), pp. 497-528.

Franzoni, F. (2009) 'Underinvestment vs. overinvestment: Evidence from price reactions to pension contributions', *Journal of Financial Economics*, 92(3), pp. 491-518.

Gallego, F. and Beyer, H. (2013) *Education and Productivity: Some New Evidence and Implications for Chile*.

Ghaly, M., Dang, V. A. and Stathopoulos, K. (2015) 'Cash holdings and employee welfare', *Journal of Corporate Finance*, 33, pp. 53-70.

Gilson, S. C. (1989) 'Management turnover and financial distress', *Journal of financial Economics*, 25(2), pp. 241-262.

Goetsch, D. L. and Davis, S. B. (2014) *Quality management for organizational excellence*. pearson.

Green, F., Machin, S. and Wilkinson, D. (1996) 'An analysis of workplace training and skill shortages'.

Griffeth, R. W., Hom, P. W. and Gaertner, S. (2000) 'A meta-analysis of antecedents and correlates of employee turnover: Update, moderator tests, and research implications for the next millennium', *Journal of management*, 26(3), pp. 463-488.

Guerrazzi, M. (2016) 'The effect of training on Italian firms' productivity: microeconomic and macroeconomic perspectives', *International Journal of Training and Development*, 20(1), pp. 38-57.

Guney, Y., Ozkan, A. and Ozkan, N. (2007) 'International evidence on the non-linear impact of leverage on corporate cash holdings', *Journal of Multinational financial management*, 17(1), pp. 45-60.

Han, S. and Qiu, J. (2007) 'Corporate precautionary cash holdings', *Journal of Corporate Finance*, 13(1), pp. 43-57.

Harford, J., Mansi, S. A. and Maxwell, W. F. (2012) 'Corporate governance and firm cash holdings in the US', in *Corporate Governance*. Springer, pp. 107-138.

Harter, J. K., Schmidt, F. L. and Hayes, T. L. (2002) 'Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis', *Journal of applied psychology*, 87(2), p. 268.

Herzberg, F., Mausner, B. and Snyderman, B. B. (2011) *The motivation to work*. Transaction publishers.

Hochberg, Y. V. and Lindsey, L. (2010) 'Incentives, targeting, and firm performance: an analysis of non-executive stock options', *Review of Financial Studies*, p. hhq093.

Holder, M. E., Langrehr, F. W. and Hexter, J. L. (1998) 'Dividend policy determinants: An investigation of the influences of stakeholder theory', *Financial management*, pp. 73-82.

Hong, H., Kubik, J. D. and Scheinkman, J. A. (2012) *Financial constraints on corporate goodness*.

Hsiao, C. (1986) 'Analysis of Panel Data, Econometric Society Monograph No. 11'. Cambridge: Cambridge University Press.

Hsiao, Y. C., Chen, C. J., Guo, R. S. and Hu, K. K. (2015) 'First-mover strategy, resource capacity alignment, and new product performance: a framework for mediation and moderation effects', *R&D Management*.

Huang, C. J., Liao, T.-L. and Chang, Y.-S. (2015) 'Over-investment, the marginal value of cash holdings and corporate governance', *Studies in Economics and Finance*, 32(2), pp. 204-221.

Huselid, M. A., Jackson, S. E. and Schuler, R. S. (1997) 'Technical and strategic human resources management effectiveness as determinants of firm performance', *Academy of Management journal*, 40(1), pp. 171-188.

Ittner, C. D., Lambert, R. A. and Larcker, D. F. (2003) 'The structure and performance consequences of equity grants to employees of new economy firms', *Journal of Accounting and Economics*, 34(1), pp. 89-127.

Jensen, M. C. (1986) 'Agency cost of free cash flow, corporate finance, and takeovers', *Corporate Finance, and Takeovers. American Economic Review*, 76(2).

Jiao, Y. (2010) 'Stakeholder welfare and firm value', *Journal of Banking & Finance*, 34(10), pp. 2549-2561.

Judson, R. (1998) 'Economic growth and investment in education: how allocation matters', *Journal of Economic Growth*, 3(4), pp. 337-359.

Kaplan, R. S. and Norton, D. P. (1995) 'Putting the balanced scorecard to work', *Performance measurement, management, and appraisal sourcebook*, 66, p. 17511.

Kaufman, B. E. (2015) 'Market competition, HRM, and firm performance: The conventional paradigm critiqued and reformulated', *Human Resource Management Review*, 25(1), pp. 107-125.

Keynes, J. M. (1936) 'The general theory of interest, employment and money'. London: Macmillan.

Kim, E. and Ouimet, P. (2014) 'Broad-Based Employee Stock Ownership: Motives and Outcomes', *The Journal of Finance*, 69(3), pp. 1273-1319.

Klasa, S., Maxwell, W. F. and Ortiz-Molina, H. (2009) 'The strategic use of corporate cash holdings in collective bargaining with labor unions', *Journal of Financial Economics*, 92(3), pp. 421-442.

Koedinger, K. R., Kim, J., Jia, J. Z., McLaughlin, E. A. and Bier, N. L. (2015) *Proceedings of the Second (2015) ACM Conference on Learning@ Scale*. ACM.

Kogan, K., El Ouardighi, F. and Chernonog, T. (2016) 'Learning by doing with spillovers: Strategic complementarity versus strategic substitutability', *Automatica*, 67, pp. 282-294.

Konings, J. and Vanormelingen, S. (2015) 'The impact of training on productivity and wages: firm-level evidence', *Review of Economics and Statistics*, 97(2), pp. 485-497.

Lall, S. (1998) 'Technology and human capital in maturing Asian countries', *Science Technology & Society*, 3(1), pp. 11-48.

Lall, S. (1999) *Competing with labour: Skills and competitiveness in developing countries*. ILO.
Lawler, E. E. (2008) 'Make human capital a source of competitive advantage', *Marshall School of Business Working Paper No. MOR*, pp. 16-09.

Lazear, E. P. (1986) 'Salaries and piece rates', *Journal of business*, pp. 405-431.
Lee, J., Murphy, K. J., Oh, P. S. and Vance, M. D. (2016) 'Inside Debt and Corporate Investment'.

Lee, K.-W. and Lee, C.-F. (2009) 'Cash holdings, corporate governance structure and firm valuation', *Review of Pacific Basin Financial Markets and Policies*, 12(03), pp. 475-508.

Li, X., Qin, X., Jiang, K., Zhang, S. and Gao, F.-Y. (2015) 'Human Resource Practices and Firm Performance in China: The Moderating Roles of Regional Human Capital Quality and Firm Innovation Strategy', *Management and Organization Review*, 11(02), pp. 237-261.

Lieberman, M. B. and Montgomery, D. B. (1988) 'First-mover advantages', *Strategic management journal*, 9(S1), pp. 41-58.

Lin, H.-F. (2007) 'Effects of extrinsic and intrinsic motivation on employee knowledge sharing intentions', *Journal of information science*.

Lins, K. V., Servaes, H. and Tamayo, A. (2015) 'Social capital, trust, and firm performance during the financial crisis', *Trust, and Firm Performance During the Financial Crisis (January 26, 2015)*.
Lynch, L. M. and Black, S. E. (1995) *Beyond the incidence of training: evidence from a national employers survey*.

Mahy, B., Rycx, F. and Vermeylen, G. (2015) 'Educational mismatch and firm productivity: Do skills, technology and uncertainty matter?', *De Economist*, 163(2), pp. 233-262.

Majumdar, S. K. (1998) 'Assessing comparative efficiency of the state-owned mixed and private sectors in Indian industry', *Public Choice*, 96(1-2), pp. 1-24.

McManus, J., Floyd, D. and Enderwick, P. (2009) 'Responding to global crisis: the contribution of emerging markets to strategic adaptation', *International Journal of Emerging Markets*, 4(4), pp. 358-374.

Modigliani, F. and Miller, M. H. (1958) 'The cost of capital, corporation finance and the theory of investment', *The American economic review*, 48(3), pp. 261-297.

Morck, R. and Yeung, B. (1991) 'Why investors value multinationality', *Journal of Business*, pp. 165-187.
Mourshed, M., Patel, J. and Suder, K. (2014) 'Education to employment: Getting Europe's youth into work', *McKinsey & Company*.

Mowday, R. T., Porter, L. W. and Steers, R. M. (2013) *Employee—organization linkages: The psychology of commitment, absenteeism, and turnover*. Academic Press.

Moye, J. J., Dugger Jr, W. E. and Starkweather, K. N. (2015) 'Learning by Doing Study: Analysis of Second-Year Results', *Technology and Engineering Teacher*, 75(1), pp. 18-25.

Neter, J., Wasserman, W. and Kutner, M. (1990) 'Multicollinearity diagnostics—Variance inflation factor', *Applied linear statistical models*, pp. 407-411.

Noorbakhsh, F., Paloni, A. and Youssef, A. (2001) 'Human capital and FDI inflows to developing countries: New empirical evidence', *World development*, 29(9), pp. 1593-1610.

Opler, T., Pinkowitz, L., Stulz, R. and Williamson, R. (1999) 'The determinants and implications of corporate cash holdings', *Journal of financial economics*, 52(1), pp. 3-46.

Opler, T. C. and Titman, S. (1994) 'Financial distress and corporate performance', *The Journal of Finance*, 49(3), pp. 1015-1040.

Oyer, P. (2004) 'Why do firms use incentives that have no incentive effects?', *The Journal of Finance*, 59(4), pp. 1619-1650.

Ozkan, A. and Ozkan, N. (2004) 'Corporate cash holdings: An empirical investigation of UK companies', *Journal of Banking & Finance*, 28(9), pp. 2103-2134.

Primoff, E. and Fine, S. A. (1988) 'A history of job analysis', *The job analysis handbook for business, industry and government*, 1, pp. 14-29.

Rajan, R. G. and Zingales, L. (2000) *The governance of the new enterprise*.
Samake, I. and Yang, Y. (2011) *Low-Income Countries' BRIC Linkage: Are There Growth Spillovers?* International Monetary Fund.

Say, J. B. (1821) *Tratado de economia política*. F. villalpando.
Schmalz, M. C. (2013) 'Managing human capital risk', *Ross School of Business, Michigan University, Working Paper*, (1215).

Schultz, T. W. (1961) 'Investment in human capital', *The American economic review*, 51(1), pp. 1-17.
Schultz, T. W. (1993) 'The economic importance of human capital in modernization', *Education Economics*, 1(1), pp. 13-19.

Selingo, J. J. (2015) 'Why are so many college students failing to gain job skills before graduation', *The Washington Post*.

Sesil, J. C., Kroumova, M. K., Blasi, J. R. and Kruse, D. L. (2002) 'Broad-based Employee Stock Options in US 'New Economy'Firms', *British Journal of Industrial Relations*, 40(2), pp. 273-294.

Smith, A. (1776) 'An inquiry into the nature and causes of the wealth of nations: Volume One'.

Snieška, V. and Drakšaitė, A. (2015) 'The role of knowledge process outsourcing in creating national competitiveness in global economy', *Engineering Economics*, 53(3).

Stein, J. C. (2003) 'Agency, information and corporate investment', *Handbook of the Economics of Finance*, 1, pp. 111-165.

Stevens, M. (1994) 'An investment model for the supply of training by employers', *The Economic Journal*, pp. 556-570.

Taylor, S. (2016) '9. Compensation policy and employee turnover', *Research Handbook on Employee Turnover*, p. 166.

Tett, R. P. and Meyer, J. P. (1993) 'Job satisfaction, organizational commitment, turnover intention, and turnover: path analyses based on meta-analytic findings', *Personnel psychology*, 46(2), pp. 259-293.

Thompson, P. (2010) 'Learning by doing', *Handbook of the Economics of Innovation*, 1, pp. 429-476.

Titman, S. (1984) 'The effect of capital structure on a firm's liquidation decision', *Journal of financial economics*, 13(1), pp. 137-151.

Ton, Z. and Huckman, R. S. (2008) 'Managing the impact of employee turnover on performance: The role of process conformance', *Organization Science*, 19(1), pp. 56-68.

Un, C. A. and Cuervo-Cazurra, A. (2008) 'Do subsidiaries of foreign MNEs invest more in R&D than domestic firms?', *Research Policy*, 37(10), pp. 1812-1828.

Vivarelli, M. (2013) 'Technology, employment and skills: an interpretative framework', *Eurasian Business Review*, 3(1), pp. 66-89.

Vomberg, A., Homburg, C. and Bornemann, T. (2015) 'Talented people and strong brands: The contribution of human capital and brand equity to firm value', *Strategic Management Journal*, 36(13), pp. 2122-2131.

Wagner, J. (2002) 'The causal effects of exports on firm size and labor productivity: first evidence from a matching approach', *Economics Letters*, 77(2), pp. 287-292.
Whited, T. M. and Wu, G. (2006) 'Financial constraints risk', *Review of Financial Studies*, 19(2), pp. 531-559.

Wilson, D. and Purushothaman, R. (2003) 'Global economics paper no. 99: Dreaming with BRICs: The path to 2050', *Goldman Sachs. October*, 1.

Wozniak, G. D. (1987) 'Human capital, information, and the early adoption of new technology', *Journal of Human Resources*, pp. 101-112.

Wruck, K. H. (1990) 'Financial distress, reorganization, and organizational efficiency', *Journal of financial economics*, 27(2), pp. 419-444.

Wu, X., Ramesh, M. and Howlett, M. (2015) 'Policy capacity: A conceptual framework for understanding policy competences and capabilities', *Policy and Society*, 34(3), pp. 165-171.

Yousef, D. A. (1998) 'Satisfaction with job security as a predictor of organizational commitment and job performance in a multicultural environment', *International Journal of Manpower*, 19(3), pp. 184-194.

Zingales, L. (2000) 'In search of new foundations', *The journal of Finance*, 55(4), pp. 1623-1653.